

183

OPERATIONS OF THE TENNESSEE VALLEY AUTHORITY

(103-49)

Y 4.P 96/11:103-49

Operations of the Tennessee Valley...

HEARING BEFORE THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT OF THE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION HOUSE OF REPRESENTATIVES ONE HUNDRED THIRD CONGRESS

SECOND SESSION

MARCH 9, 1994

Printed for the use of the
Committee on Public Works and Transportation



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TO: **Members, Subcommittee on Investigations and Oversight**

FROM: **Subcommittee Staff**

RE: **Summary of Subject Matter of Investigations and Oversight hearing on the Operations of the Tennessee Valley Authority, to be held on March 9, 1994, 9:30 a.m., Room 2167 Rayburn House Office Building.**

INTRODUCTION

The purpose of the hearing is to examine the operations of the Tennessee Valley Authority (TVA). The hearing will focus on TVA's nuclear power program, the debt incurred as a result of nuclear operations and construction, and the implementation of an Integrated Resource Plan as required by the Energy Policy Act of 1992.

The Subcommittee will receive testimony from TVA, the Nuclear Regulatory Commission (NRC), TVA power distributors and industrial users, and representatives from Oak Ridge Laboratory, Louisiana State University, the University of Alabama, and the Tennessee Valley Energy Reform Coalition.

This memorandum provides an overview of TVA and its power program. It will also explain how the NRC regulates the nuclear power industry. TVA's Integrated Resource Plan will be discussed together with how future electric demand forecasting affects the TVA power program and the agency's need for borrowing to fund capital construction projects. An explanation of how TVA finances capital construction projects, such as nuclear facility rehabilitation and construction, is included. The memo also summarizes TVA's debt obligations and how they affect both current operations and TVA's competitiveness with other utilities. Finally, a list of witnesses who will appear at the hearing is included.

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BACKGROUND - TENNESSEE VALLEY AUTHORITY

TVA was established as a multi-purpose, independent, Federal Corporation by the Tennessee Valley Authority Act of 1933 (16 U.S.C. 831). TVA was one of the many New Deal initiatives developed by the Roosevelt Administration in the 1930's. When TVA was created, only three farms in one hundred had electricity in the Tennessee Valley. The annual per capita income of workers in the Tennessee Valley was \$169. Periodic flooding of the Tennessee River and its tributaries caused millions of dollars of damage.

The Act established TVA to improve the quality of life in the Tennessee River Valley through navigation improvements, agricultural and economic development, and flood control and water resource management. TVA was also directed to maintain and operate federal properties, including electric generating and nitrite production facilities (former defense sites) located at Muscle Shoals, Alabama. The 1933 Act created a three member board, appointed by the President, to manage TVA. The board members are appointed for nine year overlapping terms. The board has total operating authority, including the sole authority to set electric rates.

The TVA service area encompasses 80,000 square miles spread across seven states. These states include Tennessee and parts of Kentucky, Virginia, North Carolina, Georgia, Alabama, and Mississippi (Attachment 1). Roughly eight million people live in the TVA service area. TVA programs can be divided into two categories: power generation programs (Power Group) and non-power programs (Resource Group).

By pursuing its mandate of economic development and flood control (multi-use dams that produce hydroelectric power) TVA has become one of the nation's largest electric utilities. During World War II TVA's hydroelectric system could not produce the additional power needed for the war effort, so TVA began building coal-fired power plants to supplement its power system. In the mid 1960's, TVA decided to add nuclear generating plants to its power system. The TVA power system consists of 29 hydroelectric dams, 11 coal-fired plants, two nuclear plants (comprised of three operating units), 4 natural gas combustion turbines, and 1 hydroelectric pumped storage plant (attachment 2). In addition, eight Army Corps of Engineers dams that produce power for the Southeastern Regional Power Administration contribute hydroelectric power to TVA through marketing agreements. TVA power is sold to 160 municipal and cooperative distributors and to a number of directly served large industrial customers and federal agencies.

Until 1959, TVA power operations were financed primarily by federal appropriations. Appropriated power funds had totaled

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\$1.2 billion. In 1959 Congress passed the TVA Self-Financing Act (P.L. 86-157) that authorized the use of debt financing to pay for capital improvements for the power program. Congress also required that TVA's power program be self-sustaining -- no longer funded by federal appropriations. TVA must charge sufficient electric rates to cover the cost of operations, maintenance, and capital improvements for the power program. The 1959 Act also directed TVA to pay back to the federal government its initial appropriations out of future power revenues.

The TVA Self-Financing Act placed a \$750 million limit on TVA borrowing. In 1966 Congress raised the debt limit to \$1.75 billion and in 1970 the limit was raised to \$5 billion. Increasing nuclear construction costs required another increase in the debt limit in 1975 to \$15 billion. TVA is currently operating under a \$30 billion debt limit authorized by Congress in 1979. TVA has outstanding debt of \$25.3 billion and estimates that they will need to borrow another \$250-\$300 million in fiscal year 1994.

The non-power programs of TVA are funded through federal appropriations. TVA received \$135.36 million in funding for fiscal year 1993 and is receiving \$140.49 million in fiscal year 1994. TVA's water resources, navigation, and flood control programs are operated primarily within the 41,000 square mile Tennessee River watershed. TVA has stewardship over 641,000 surface acres of water, 11,000 miles of shoreline, 420,000 acres of public land, 54 dams, 1000 miles of navigable waterways, 174 public recreation areas, and 426 miles of public trails. Many of TVA's economic development programs are funded through appropriations and managed by the Resource Group.

TVA'S POWER PROGRAM

The 1933 Tennessee Valley Authority Act established TVA as an independent federal corporation with many missions. Six decades later, TVA's largest program is power generation. TVA is one of the nation's largest electric utilities and it has more coal-fired capacity than any electric utility in the nation. In 1993 TVA's power system peak load generating capacity reached 23,878 megawatts. Sales of electricity set a record at 118.56 billion kilowatt-hours. TVA generated power in 1993 using coal-fired plants (76%), hydroelectric (15%), and nuclear units (9%). In 1993 TVA's power revenues totaled \$5.27 billion, with a net power income of \$311 million. Net power income is operating revenue minus operating expenses, without any deduction for capital expenses.

TVA is primarily a wholesaler of power. It sells power to 160 municipal and cooperative utilities and directly served large industrial customers and federal agencies. TVA distributor

contracts generally span 10-year terms and are exclusive -- distributors are required to purchase power only from TVA. In 1990 TVA renewed 155 distributor contracts to add a provision that allowed distributors to leave the TVA system with 10 years notice. If notice is not given after the passage of a year, an additional year is added to the contract term. The remaining five distributors in the TVA system continue to operate under contract terms that pre-date the 1990 contract renewals. Under certain circumstances these five distributors may leave the TVA system upon four years notice.

Directly served industrial customers usually operate under 10-year contracts with TVA. Termination terms vary depending on the amount of power purchased and the number of years the customer has operated on the TVA system. TVA charges directly served customers the same rates charged by distributors to industrial customers with peak power demands greater than 25,000 kilowatts. In this way, TVA does not lure industrial customers away from distributors by charging lower rates.

TVA's service area is defined by the 1959 TVA Self-Financing Act (the TVA "fence"). When Congress directed TVA to make its power program self-sustaining, and authorized the use of debt financing, the Congress also protected surrounding utilities from competition by TVA because it was a low cost federal utility. TVA was prohibited from entering into contracts that would allow TVA or its distributors to provide power outside the area the corporation and its distributors served on July 1, 1957. Marketing agreements with surrounding utilities entered into by TVA before July 1, 1957 are not subject to the statutory fence. Therefore, TVA can sell wholesale surplus power to certain utilities outside of the TVA service area.

TVA's power generation importance goes beyond its seven-state service area. TVA's transmission system is directly linked with 13 southeastern utilities. These direct links provide indirect links to more distant service areas which gives TVA the ability to transmit power throughout the Eastern Interconnected System. This transmission system encompasses all of the states east of the Mississippi River. During the extreme cold weather that occurred in January of 1994, TVA power was being transmitted as far away as New England and the Upper Midwest.

Nuclear Power Program

In the 1930's TVA had met the power needs of the Tennessee Valley with hydroelectric generation. In the 1940's, TVA started to build coal-fired power plants to meet additional power needs. TVA continued to project large increases in electricity demand in the TVA service area and embarked on an ambitious nuclear construction program in 1966. TVA chose to build nuclear units because cost-effective hydroelectric sites had already been

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utilized and coal-fired plants had large fuel costs in comparison with nuclear powered plants.

At the height of the nuclear construction period in the 1970's, TVA had 17 nuclear reactor units under construction or operating at seven sites. Browns Ferry units 1, 2, and 3 began commercial operations in 1974, 1975, and 1977, respectively. Sequoyah units 1 and 2 began commercial operations in 1981 and 1982. By August of 1982, TVA realized its electricity demand projections were significantly overstated and canceled construction of four nuclear units at the Phipps Bend and Clinch River plants. Electricity demand remained weak and TVA canceled construction of four more nuclear units at the Hartsville and Yellow Creek plants in 1984. TVA had to write off the \$4.6 billion expended at the canceled plants. The debt was paid over a 10-year period.

After a series of operating incidents at the Browns Ferry and Sequoyah plants, TVA shut down all five nuclear units in August of 1985. At this time TVA also deferred construction on Bellefonte units 1 and 2 and Watts Bar unit 2. Watts Bar unit 1, which was waiting for an operating license from the Nuclear Regulatory Commission (NRC) was also placed on deferral. TVA's operating units had been cited for an increasing number of regulatory violations by the NRC which resulted in the imposition of civil fines. The NRC had identified three problem areas in the TVA nuclear program: (1) overall programmatic and management deficiencies; (2) specific operating deficiencies at the Browns Ferry and Sequoyah plants; (3) numerous employee complaints regarding the construction quality of Watts Bar units 1 and 2.

In 1986 TVA hired retired Admiral Steven A. White to manage their nuclear program recovery. Admiral White hired 26 outside contractors to help manage the nuclear program. A nuclear performance plan was developed and submitted to the NRC for review. The plan was accepted by the NRC and efforts were started to return the Sequoyah and Browns Ferry nuclear units to commercial operation. Recovery efforts were well underway when Admiral White and the contract managers were replaced by TVA nuclear managers in 1988. Sequoyah units 1 and 2 were restarted in May and November of 1988. By May of 1989, the NRC removed the Sequoyah plant from its list of plants that needed heightened regulatory monitoring. TVA returned Browns Ferry unit 2 to commercial operation in August 1991. In June of 1992, the NRC notified TVA that Browns Ferry unit 2 would no longer need heightened regulatory monitoring. Browns Ferry unit 1 remains in deferral status, while unit 3 is scheduled for restart toward the end of 1995.

MILESTONES OF TVA NUCLEAR PLANTS

Nuclear Plant (Units)	Commercial Service Date	Forced Outage	Restart Date	Current Status
Browns Ferry				
1	1974	1985		Deferred**
2	1975	1985	1991	In operation
3	1977	1985	1995*	Not operating
Sequoyah				
1	1981	1985	1988	Not operating***
2	1982	1985	1988	In operation***
Watts Bar				
1	1995*			Under Construction
2	None			Deferred**
Bellefonte				
1	None			Deferred**
2	None			Deferred**
Phipps Bend	None			Canceled 1982
1				
2				
Hartsville	None			
1				Canceled 1984
2				Canceled 1984
3				Canceled 1982
4				Canceled 1982
Yellow Creek	None			Canceled 1984
1				
2				

- * The start date for Watts Bar unit 1 and the restart date for Browns Ferry unit 3 are TVA estimates.
- ** The decision to construct or cancel deferred nuclear units will be determined through TVA's IRP process.
- *** Sequoyah units 1 and 2 were shut down on March 1, 1993, after a steam leak occurred in the non-nuclear piping system of unit 2. Unit 2 was returned to service in November of 1993 and unit 1 is expected to return to service in March of 1994.

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The Sequoyah units operated within nuclear industry standards for reliability for several years until a steam leak occurred in unit 2's non-nuclear piping system on March 1, 1993. As a precaution, unit 1 was also shut down. TVA found excessive corrosion was occurring in some of the piping. Repairs were made and unit 2 was returned to commercial operation in October of 1993. Unit 1 is still waiting to be restarted, and is expected (by TVA) to be restarted in March of 1994. Browns Ferry unit 2 has operated reliably since its restart in 1991.

The Watts Bar plant has never been licensed for operation by the NRC. Unit 1 construction was complete in 1985; however, a significant number of employee complaints concerning construction quality prompted TVA to stop work at the plant. The NRC identified a substantial number of deficiencies at the plant, including lack of design verification, improper welding, damaged electrical cable, substandard replacement parts, faulty control room design, lack of seismic integrity, inadequate fire protection, and missing quality assurance records. The NRC was also very concerned about incidents of management retaliation that occurred against TVA workers who reported safety concerns.

Watts Bar unit 1 remains the only TVA nuclear unit characterized as under construction. TVA suspended repair work at Watts Bar in December of 1990 when the quality of the repairs was called into question by TVA employees. The NRC conducted a review of the Watts Bar repair process. In November of 1991 the NRC allowed repairs to continue at the plant. TVA estimates that 93 of an identified 135 systems modifications have been completed at unit 1. TVA estimates that unit 1 will be ready for fuel loading sometime in 1994 and commercial operation should be ready in 1995. Watts Bar unit 2 remains in deferral status.

The remaining TVA nuclear plant, Bellefonte units 1 and 2, are in deferral status. No construction work has occurred at the plant since work was halted in 1985. TVA has continued to maintain the facility and equipment. TVA is also continuing design work to assess the cost of completing the plant should a decision be made through the Integrated Resource Plan process to finish it.

NUCLEAR REGULATORY COMMISSION

The NRC regulates nuclear facilities, including nuclear power plants, to ensure the safe operation of radiological facilities. A construction permit is required from the NRC to build a nuclear power plant. An elaborate set of design and construction regulatory standards must be met. The NRC maintains a force of site inspectors to monitor construction. The only nuclear power plant currently under construction in the United States is Watts Bar unit 1. After construction is complete, an operating license must be obtained from the NRC. Before a

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license is issued, the plant must undergo a series of systems tests to identify any problems in the power generation or safety systems. Finally, a "hot functional test" is required. This test places the plant systems under an operational load to ensure all of the plant systems will function properly before loading fuel and starting the nuclear reactors. The NRC monitors every phase of systems testing. After a plant is licensed for operation, nuclear fuel may be loaded into the reactors and commercial operation can begin.

The NRC regularly inspects nuclear facilities and operations. Nuclear power plants periodically undergo Systematic Assessment of Licensee Performance (SALP) reviews. The SALP process rates licensees in four functional areas: operations, maintenance, engineering, and plant support. Plant support includes radiological controls, security, emergency preparedness, fire protection, and housekeeping controls. NRC ratings are "1" (performance substantially exceeds regulatory requirements), "2" (performance is above that needed to meet regulatory requirements), and "3" (performance meets but does not exceed that needed to meet minimal regulatory requirements). A category "3" rating results in increased NRC regulatory monitoring of that functional area.

Sequoyah units 1 and 2 had a SALP evaluation for the period August 2, 1992, through October 9, 1993. Sequoyah received a SALP rating of "1" in plant support, "2" in engineering, and a "3" rating in operations and maintenance. Browns Ferry unit 2 had a SALP evaluation for the period May 24, 1991, through May 23, 1993. Browns Ferry received a SALP rating of "1" in plant support and a "2" rating was issued for engineering and operations and maintenance. No "3" ratings were issued for Browns Ferry.

NRC's safety reviews play a critical role in TVA's nuclear operations and, therefore, its financial health. As we discuss in greater detail below, TVA's nuclear plants can be a valuable asset and generate revenues that can be used to pay off TVA's debt, if they operate reliably. Conversely, if TVA's nuclear plants suffer frequent shutdowns by the NRC because of safety problems, they will not generate enough revenue to pay off the debt incurred to construct them, and TVA's ratepayers will have to make up the difference by paying higher rates.

After the Three Mile Island nuclear accident in 1979, the NRC significantly strengthened the regulatory oversight of nuclear power plants. As a result of this regulatory effort, many utilities had to retro-fit their nuclear plants. The cost of meeting new NRC regulatory requirements increased the cost of generating power at some older nuclear units to uncompetitive levels. Some utilities shut down their nuclear units rather than retro-fit them. New NRC regulations also increased the cost of

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constructing nuclear power plants. With electricity demand weak throughout much of the nation in the 1970's and 1980's and the additional costs caused by new NRC regulations, many utilities canceled nuclear plant design and construction.

TVA DEBT

The 1959 TVA Self-Financing Act amended the 1933 TVA Act to authorize TVA to issue and sell bonds, notes, and other evidences of indebtedness to assist in financing its power program and to refund those bonds. Bond proceeds must be used for the construction, improvement, or replacement of power plants or transmission facilities. The principal and interest on power bonds is payable solely from TVA's net power proceeds. TVA power bonds are not obligations of the United States and are not guaranteed by the full faith and credit of the United States. The 1959 Act placed a debt limitation on TVA of \$750 million. TVA's debt limit has been periodically raised by Congress since 1966.

TVA has incurred a significant amount of debt in the past two decades. Much of this debt can be attributed to nuclear program construction. In 1979, the last year Congress raised TVA's debt limit, TVA debt totaled \$9.3 billion. Today, TVA's debt totals \$25.3 billion. TVA has recently been successful in reducing the interest charges on this debt by refinancing it at lower interest rates. However, some of its debt is "non-callable" and therefore cannot be refinanced prior to a specified redemption date.

TVA has attempted to reduce its interest costs on this "non-callable" debt through a procedure called "in-substance defeasance". This technique involves borrowing money at low current interest rates and using the money to invest in irrevocable trust arrangements that are pledged to provide repayment of the "non-callable" debt as it matures. TVA has \$3.25 billion in "non-callable" power bonds that are to be repaid under this arrangement. TVA considers this debt for all practical purposes paid; therefore, TVA does not count this debt against the \$30 billion statutory debt limit. The general counsel's office of the Office of Management and Budget is currently drafting an opinion on whether the defeased debt should count toward the statutory debt limit. The opinion should be issued sometime in March.

As TVA's debt has increased, so has the interest expense to service that debt. In 1968 interest expenses accounted for 4.91% of TVA's power revenues. Twenty years later, in 1987, TVA's interest expenses accounted for 30.38% of power revenues. Today, TVA still incurs interest expenses that account for roughly 30% of revenues. By comparison, utilities that surround the TVA service area average interest expenses that account for

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roughly 6% of revenues. TVA has recently been successful in holding interest expenses relatively stable by refinancing higher interest debt with new lower interest debt. Although TVA continues to incur additional debt, it has lowered its annual interest expense by \$259 million since 1989. TVA has not paid down its debt to reduce interest expenses and has no plans to do so.

TVA has averaged approximately \$1 billion a year of borrowing for the past 10 years, either by borrowing from the Federal Financing Bank, or by selling power bonds on the public financial markets. During that time, TVA spent \$2.6 billion on Watts Bar unit 1 construction for a total investment of \$6.1 billion (includes capitalized interest). During that same time frame, TVA has spent \$2.9 billion to bring Browns Ferry unit 2 back in operation (includes capitalized interest).

Continuing to spend billions of dollars to rehabilitate and construct nuclear power plants only makes sense if the plants operate reliably and generate revenues that exceed the cost of producing the power. Unfortunately, TVA's nuclear plants have historically operated below the nuclear utility industry average as a percentage of available capacity. Capacity factor is measured by taking the amount of electricity generated over a period of time and expressing it as a percentage of the amount of electricity that could have been generated if the plant had operated at full capacity over the same period of time.

The average capacity factor through 1992 for the three TVA nuclear units now operating are: Sequoyah unit 1 - 46.20%, Sequoyah unit 2 - 49.15%, and Browns Ferry unit 2 - 38.48%. The national nuclear utility average capacity has historically exceeded 60%. The TVA capacity factors have been lowered by the 1985 shut down of all of their nuclear units. TVA's operating performance has improved over the past several years. Browns Ferry unit 2 operated at a capacity factor of 86.98% in 1992.

TVA estimates that it will total \$5.5 billion in capital expenditures during fiscal years 1994, 1995, and 1996. Most of these expenditures will be met through borrowing. To meet TVA's capital construction projections, it is likely that the statutory debt limit would need to be raised before the end of the decade. Increasing interest expenses could limit TVA's ability to generate electricity at competitive rates. Rising interest expenses could be offset by rate increases. The TVA Board has the authority to set rates at any level and raise rates at any time. However, the ever growing competitive nature of the electric utility industry may limit TVA's ability to raise rates. Competitiveness issues will be discussed in the following section of the memo.

INTEGRATED RESOURCE PLANNING

The 1992 Energy Policy Act (P.L. 102-486) required the Tennessee Valley Authority to conduct a least-cost planning program, known throughout the utility industry as an Integrated Resource Plan (IRP). The Act directed TVA to implement a planning and selection process for new energy resources which evaluates a full range of existing resources, including new power supplies, energy conservation and efficiency, and renewable energy resources. The goal of the IRP is to identify ways to provide adequate and reliable electric service to TVA customers at the lowest system cost.

The 1992 Act required TVA to provide their distributors an opportunity to participate in the IRP process. In addition, TVA must provide a public review and comment period before the selection and addition of any major new energy resource for the TVA power system. TVA has initiated a two-year IRP process. They intend to develop a 3- to 5-year implementation plan and a 25-year long-term energy strategy through the IRP process. TVA plans to issue a draft IRP in June of 1995, solicit public comments over a three-month period, and publish the final IRP in November of 1995. Any final IRP would need to be approved by the TVA Board.

Many electric utilities have been preparing resource plans for years, often in response to public utility commission requirements. TVA is a unique utility in that it is not regulated by an independent entity. Therefore, other than the statutory requirements found in the 1992 Energy Policy Act, there are no required elements that TVA must incorporate into either the planning process or the final IRP document developed by TVA. At the outset of the planning process, TVA decided not to include Watts Bar unit 1 or Browns Ferry unit 3 in the IRP. However, Watts Bar unit 2, Browns Ferry unit 1, and Bellefonte units 1 and 2 are included and their completion, continued deferral, or cancellation will be decided through the IRP process. Because of the absence of a regulator, it is very important for the TVA IRP process to include a representative cross-section of participants who live in the TVA service area and who would be affected by the choices made in the IRP.

TVA has committed itself to forming a review group to provide advice during the IRP process. The group will have a membership of 15 to 20 people and consist of persons representing distributors, large industrial customers, environmental and public advocacy groups, academicians, and other stakeholders from the TVA service area. While TVA has offered to help staff the review group, it is not planning to provide any funding. Without funding support, the review group may be unable to obtain data independent of that supplied by TVA. The review group's

decision-making may in effect be predetermined by the data supplied by TVA.

The final results of the IRP are extremely important for the TVA ratepayers. Prior TVA decision-making has been isolated from regulatory review. The decisions that led to the massive nuclear construction program starting in 1966 have had an enormous impact on TVA electric rates. Nuclear construction spending was largely responsible for 10% rate increases every year from 1965 to 1987. The average national utility rate increase was only 7% and the average increase for utilities surrounding the TVA service area was less than 7%. Twenty years of rate increases eroded TVA's historic rate advantage over surrounding utilities. Large industrial customers left the TVA service area and new industries avoided relocating to the Tennessee Valley. The cities of Memphis, Tennessee, and Bristol, Virginia, threatened to leave the TVA power system. Memphis alone accounts for 11% of TVA's revenues.

The decisions driven by the IRP process, to meet projected electricity demand through power plant construction and independent co-generation or through demand side management and conservation, or a combination of alternatives, will be costly decisions that are ultimately borne by the TVA ratepayers. If TVA makes the wrong decisions -- for instance, relying too heavily on constructing new generating capacity while underutilizing energy conservation and demand side management -- the resulting costs could force TVA to raise electric rates.

When electric rates exceed those charged by surrounding utilities, municipal customers near the TVA system boundaries that have access to other utility transmission lines, or industrial customers that could relocate, may leave the TVA system. When customers leave, the remaining rate payers must pay higher rates to make up for the lost revenue. These higher rates in turn cause other customers to leave the TVA system. The 1992 Energy Policy Act authorized the Federal Energy Regulatory Commission (FERC) to require electric utilities to carry on their transmission lines (wheeling) electricity generated by other producers. This electricity can now be wheeled to customers within another utility's service area. Energy producers that can generate electricity with the least cost will have an advantage over higher cost utilities.

The 1992 Energy Policy Act protected TVA from new wheeling requirements; however, TVA cannot depend on legislative protection from competition forever. The TVA Board has recognized the importance of keeping electric rates stable. One of the first announcements made by Chairman Craven Crowell after his appointment by President Clinton was that TVA rates would not be raised through 1997.

XVII

Load Forecasting

One of the most important factors used for determining how to meet future electricity needs and in developing an IRP is load forecasting. Accurately projecting the future electricity needs of a utility's service area allows for the proper mix of decisions on how to meet those needs at the least cost. TVA has historically overestimated the future electricity needs of its service area. While other utilities made the same mistake in the 1960's and 1970's, only TVA chose to meet those anticipated needs by relying almost exclusively on nuclear power construction.

At the height of TVA's nuclear construction program, TVA projected that the highest electricity peak load growth rate in the nation would occur in their service area. TVA continues to justify the rehabilitation of Browns Ferry unit 3 and the construction of Watts Bar unit 1 by projecting a peak load growth rate of 2.3% -- a rate of growth that, according to statistics compiled by the North American Electric Reliability Council (NERC), equals the highest peak load growth rate of any NERC subregion (Florida). By contrast, the U.S. Census Bureau estimates Florida's population will grow twice as fast as that of the population within the TVA service area. Forecasting a high peak load growth rate to justify the completion of nuclear plants will place TVA at a competitive disadvantage if there is no demand for the electricity generated by those plants. TVA believes that it can sell any surplus power to neighboring utilities. However, whether it can sell this power at a price that will cover the costs of generating it is uncertain.

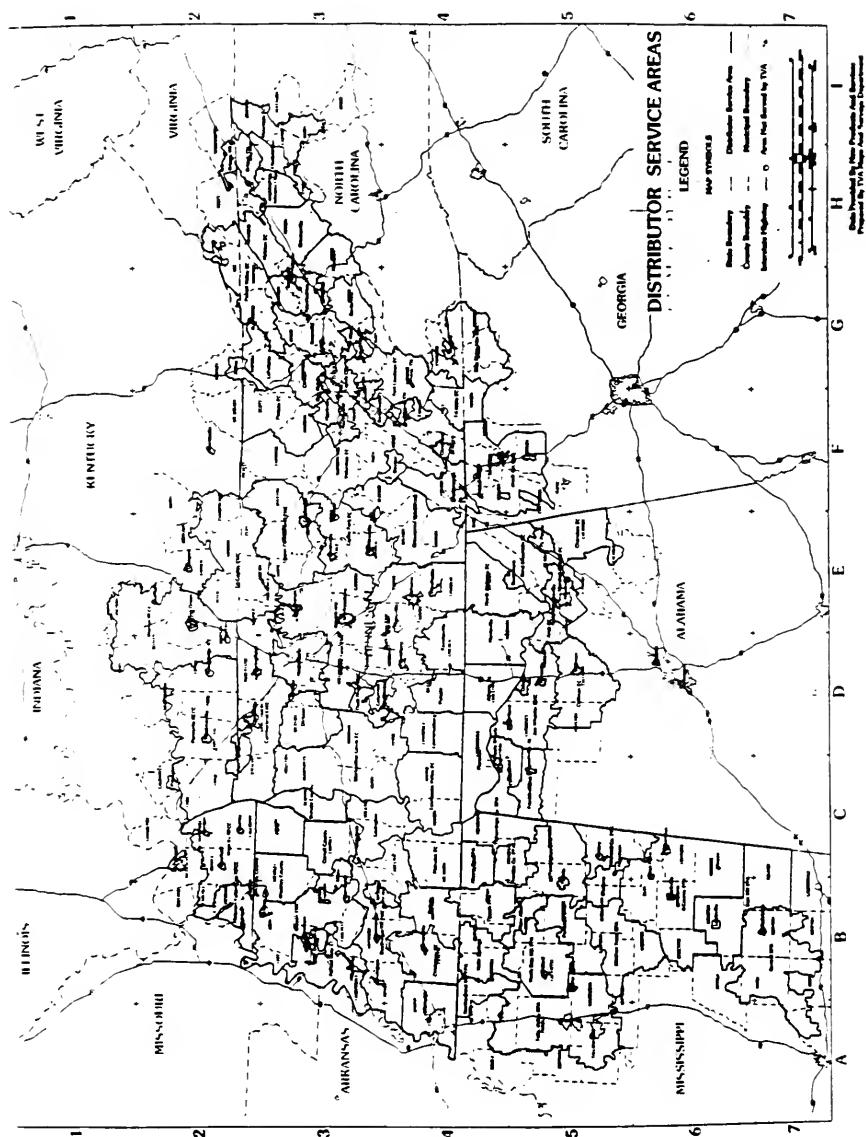
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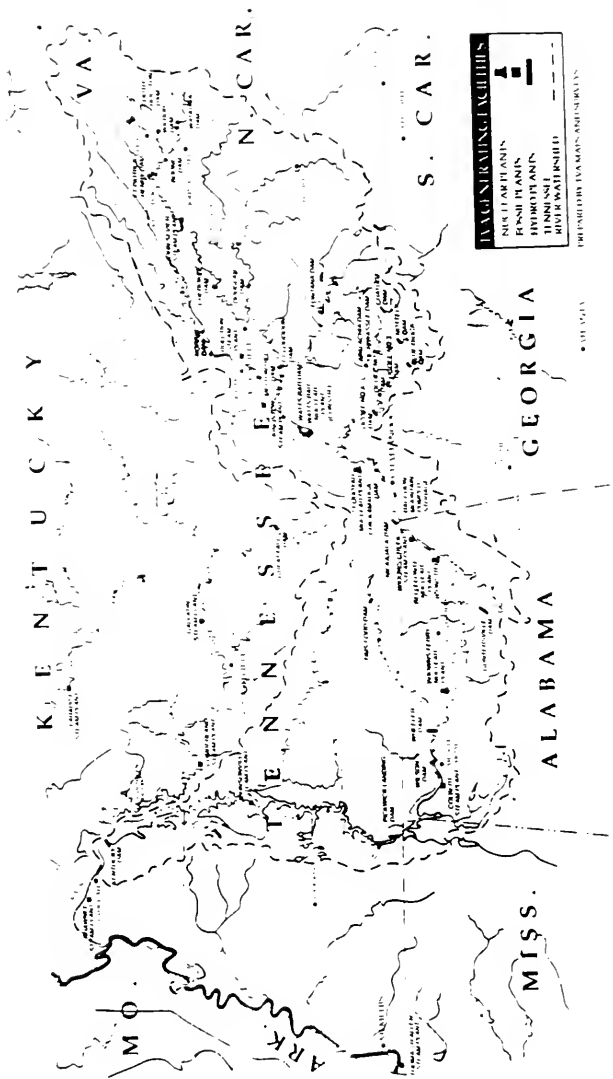
At the subcommittee's March 9th hearing, TVA Board Chairman Craven Crowell and Board members Johnny Hayes and William Kennoy will testify about TVA's nuclear power program and their efforts to control costs and implement an Integrated Resource Plan. The Board members will also discuss the administrative changes made at TVA since the appointment of Chairman Crowell. Sam A. Head Jr. and Dr. Matthew C. Cordaro will testify on behalf of TVA distributors and Tim Soles will testify on behalf of large industrial customers. They will testify about their concerns with the nuclear power program and the impact TVA's increasing debt will have on future electric rates.

Dr. Allan Pulsipher of Louisiana State University and Dr. Edward Passerini of the University of Alabama will discuss TVA's load forecasting and competitive position among electric utilities that serve the southeast. Dr. Eric Hirst of the Oak Ridge National Laboratory will explain the Integrated Resource Plan process and how TVA is implementing its plan. Finally, Dr.

XVIII

Steven Smith of the Tennessee Valley Energy Reform Coalition will testify about TVA's debt and how the nuclear construction program may not be the least cost method to meet future energy needs in the TVA service area.





OPERATIONS OF THE TENNESSEE VALLEY AUTHORITY

WEDNESDAY, MARCH 9, 1994

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT,
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:30 a.m. in room 2167, Rayburn House Office Building, Hon. Robert A. Borski (chairman of the subcommittee) presiding.

Mr. BORSKI. The subcommittee will come to order.

The subcommittee today will be reviewing the performance, operation, plans, and projections of the Tennessee Valley Authority. We are especially interested to get answers to the many serious questions that have been raised about TVA's management of its nuclear program and the huge debt load that has resulted from the massive investment in nuclear plants.

Formed more than 50 years ago as part of the New Deal, TVA was once an industry leader in power production and energy policy. Unfortunately, during its era of nuclear investment, TVA apparently fell from its preeminent position in the power industry and now many questions linger over the TVA operations. TVA is now entering a new energy era at a time when it is still attempting to recover from mistakes of the past. Not only is TVA faced with massive debt and a task of operating nuclear power plants that have had problems in the past, the TVA now faces questions of energy conservation, environmental impact, and financial management.

The subcommittee will want to know how TVA is handling the new issues that affect power production in the 1990s. TVA's decisions and performance have a major affect on the businesses and residents in the Tennessee Valley, the 8 million people in 7 states.

Where the TVA of the New Deal era could stimulate the economy of the entire area, today's TVA has the potential to be an economic drag on the region. That is why TVA's decision-making and performance are so important for the area.

I want to thank Congressman Bob Clement of Tennessee, the chairman of the congressional TVA Caucus, for bringing this important issue to our attention and for providing such great assistance in our preparation for the hearing. We hope to get a full and complete picture of TVA's performance in today's hearing. At this time of rapid change in the electric power industry, TVA should explain its policies, its decisions, and its plans that will have a tremendous impact on the people of the Tennessee Valley.

I would now like to recognize the distinguished gentleman from Tennessee, the ranking member of our Public Buildings and Grounds Subcommittee, Mr. Duncan.

Mr. DUNCAN. Thank you, Mr. Chairman. I have no formal opening statement. I would simply like to welcome the witnesses to the hearing this morning, and I look forward to hearing their testimony.

I certainly am proud to have the headquarters of the Tennessee Valley Authority in my district. The TVA has had a great history. We all need to work together to make sure that it has an even brighter future than it has a past. TVA has enjoyed broad bipartisan support since it was founded. It was a major initiative of President Franklin Roosevelt, and I guess the founding legislation of the Tennessee Valley Authority was written in large part by Senator George Norris, a Republican from Nebraska. And in recognition of that, there is very close to Knoxville the Norris dam, one of the major installations of the TVA. I think that broad bipartisan support is important to TVA if it is going to be as strong, or even stronger, in the future than it has been in years past.

I know that all the time I was growing up in the Tennessee Valley that most people looked upon TVA as one of the greatest institutions in that entire area. Then, a few years ago, there was sort of a change and many people in our area started looking upon TVA as sort of a bloated bureaucracy, and there were many stories about TVA employees and many of them not having much to do, and so forth and so on. And because of that, I think the morale at TVA dropped down. I had a TVA employee who told me at that time that he even stopped wearing his TVA badge when he went into the grocery stores and other places around our area.

But several years ago, TVA started I think making some changes and streamlining. Unfortunately, they had to lay off some people, and certainly that was sad for all of us to see. But I think that TVA started on a road a few years ago toward making improvements in their operation and trying in every way possible to become a more efficient organization. And I think there have been improvements. But every organization and every individual can always improve and get better, and I think that's what these hearings are about.

We need to find out if there is a way that TVA can improve its operation and improve its efficiency. We are particularly concerned, as you mentioned, about the large debt. I can assure you there is nobody in East Tennessee who believes in being deeply in debt. We need to find out if there is a problem with that debt and if there is something that we can do to decrease that indebtedness. Of course, we will be looking into other areas as well. I know that there are annual hearings concerning the TVA appropriations, but I am told that this is the first major in-depth hearing in regard to TVA in several years. So I commend you, Mr. Chairman, for calling this meeting. Also, I understand this is being done at the request of my good friend, Congressman Clement, who of course is the real expert on this from his service on the TVA board.

So I look forward to joining with you in these hearings and hearing what the witnesses have to say and in learning more about the

operation of the Tennessee Valley Authority. I thank you very much.

Mr. BORSKI. The Chair thanks the gentleman.

The Chair would now like to recognize the distinguished chair of the full committee, the gentleman from California, Mr. Mineta.

The CHAIR. Thank you very much, Chairman Borski. I want to join you in thanking and commending our colleague from Tennessee, Mr. Clement, for encouraging us to hold this oversight hearing on the operations of the Tennessee Valley Authority.

It has been six years since our last oversight hearings in 1988. The time is certainly appropriate to review how TVA is doing in its effort to resuscitate its nuclear program. This Committee has exercised oversight over TVA since its creation in 1933. In creating TVA, the Congress made a commitment to the people of the Tennessee Valley to help them in their aspirations to develop their economy through flood control and low cost electrical power. We continue to hold that commitment today.

TVA's nuclear program has only one purpose, and that is to bring safe, low-cost power to the people of the Tennessee Valley. If the program cannot serve that purpose, then we expect TVA's board to make such changes as are necessary in the program so that it can achieve that purpose.

TVA's debt is alarmingly high. Now while other utilities in the Southeast have interest costs that are 6 percent of their revenues, TVA's interest costs are some 30 percent of its revenues. I worry about whether the TVA can meet its obligations to provide safe, low-cost power with such an expensive debt structure.

So we look forward to TVA's integrated resource planning process. I would encourage TVA to make that process as comprehensive as possible, both in terms of the people who are represented on the review group and in terms of the issues that are considered in the planning process. I think that all of TVA's generating capacity should be reviewed as part of that process, not just plants that are under consideration.

I am committed to TVA's original concept as a federally-sponsored agency dedicated to the economic development of the Tennessee Valley and I believe that my colleagues, not only on this Committee but in the Congress as a whole, on both sides of the aisle, are also committed to that concept. TVA has nothing to fear from vigorous congressional oversight because we share your mission and your objectives. It is important that we reach a consensus on the best way to achieve them.

So again, I want to commend our colleague, Mr. Clement, for his leadership and for those from the TVA who will be making their presentation here today. Thank you very much, Mr. Chairman.

Mr. BORSKI. Thank you, sir.

The Chair would now like to recognize the distinguished gentleman from Tennessee, Mr. Clement.

Mr. CLEMENT. Thank you, Mr. Chairman. I first want to commend you for agreeing to host this joint hearing of the Public Works and Transportation Subcommittee on Investigations and Oversight and the TVA Congressional Caucus. I also want to thank your fine staff for all the work they've done in preparing for this hearing.

At this time, Mr. Chairman, I ask unanimous consent to enter into the record statements from the Chattanooga Area Urban League, Holland and Associates, the Association of Tennessee Valley Counties, the Tennessee Valley Trades and Labor Council, a speech by Larry Hobart with the American Public Power Association to the TVA distributors, Bessemer Utilities, the TVA African American Alliance, a statement by former State Senator William S. Owens, and the Tennessee Municipal Electric Power Association, as well as I ask that my prepared statement be accepted into the record as if read.

Mr. BORSKI. Without objection, it is so ordered.

[Mr. Clement's prepared statement and referenced documents follow:]

BOB CLEMENT
5TH DISTRICT TENNESSEE

COMMITTEE ON
PUBLIC WORKS AND TRANSPORTATION

COMMITTEE ON
VETERANS AFFAIRS

CONGRESSIONAL TRAVEL AND
TOURISM CAUCUS
SECRETARY TREASURER

CONGRESSIONAL TVA CAUCUS
CHAIRMAN



Congress of the United States
House of Representatives
Washington, DC 20515-1205

THE HONORABLE BOB CLEMENT
STATEMENT BEFORE THE
TVA CONGRESSIONAL CAUCUS &
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
JOINT HEARING ON
TENNESSEE VALLEY AUTHORITY
MARCH 9, 1994

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MR. CHAIRMAN, I FIRST WANT TO COMMEND YOU FOR AGREEING TO HOST THIS JOINT HEARING OF THE PUBLIC WORKS AND TRANSPORTATION SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT AND THE TVA CONGRESSIONAL CAUCUS. I ALSO WANT TO THANK YOUR FINE STAFF FOR ALL THE WORK THEY HAVE DONE IN PREPARING FOR THIS HEARING.

WHILE PREPARING FOR THE HEARING, I WAS CONSTANTLY ASKED "WHY ARE YOU HAVING A HEARING ON TVA? WHAT'S THE PURPOSE OF HAVING A HEARING?"

WHEN I BECAME CHAIRMAN OF THE TVA CONGRESSIONAL CAUCUS ONE YEAR AGO, I KNEW THE FIRST THING THAT I WANTED TO DO WAS TO BRING THE ENTIRE TVA BOARD TO WASHINGTON FOR A HEARING. THE LAST TIME OUR COMMITTEE, THE AUTHORIZING COMMITTEE FOR TVA, HELD A HEARING WAS SIX LONG YEARS AGO. SINCE TVA IS NOT REGULATED BY ANY PUBLIC UTILITY COMMISSION, CONGRESS, TO A CERTAIN DEGREE, MUST PERFORM THAT FUNCTION AS BEST WE CAN TO HELP THE BOARD ENSURE THAT THE INTERESTS OF THE VALLEY RESIDENTS ARE BEING MET.

I WAS ON THE BOARD BETWEEN 1979 AND 1981 AND I KNOW HOW IT WORKS. I KNOW THE MIND SET. THERE WAS A SAYING BACK THEN THAT THE BOARD ONLY ANSWERS TO GOD AND SOMETIMES THEY DON'T EVEN LISTEN TO HIM. THE REASON FOR THAT MIND SET CAN BE BOILED DOWN TO ONE WORD - ACCOUNTABILITY. IN 1959 WHEN CONGRESS SAID THAT ALL FUTURE TVA FUNDS WOULD BE SELF-FINANCING, THE FEDERAL GOVERNMENT WAS NO LONGER RESPONSIBLE FOR THE FINANCIAL ASPECTS OF TVA. THAT RESPONSIBILITY WAS TRANSFERRED TO THE RATEPAYER. BUT, WHAT WAS NOT TRANSFERRED BACK IN 1959 WAS THE ACCOUNTABILITY TO THE PEOPLE WHO PAY THE BILLS.

NO MEANS WERE PROVIDED TO MAKE THE TVA ACCOUNTABLE TO THE RATEPAYER. THE PEOPLE WHO WOULD PAY THE BILLS HAD NO SAY IN SELECTING THOSE WHO SET THE POLICY, WHO MANAGE AND OPERATE THE AGENCY, AND WHO WOULD SET RATES TO PAY FOR THAT POLICY. ALL THE RATEPAYERS DO IS PAY THE BILLS. AND THAT IS WHY WE ARE HERE TODAY. I AM NOT HERE AS A FORMER

MEMBER OF THE BOARD, AS A MEMBER OF CONGRESS OR EVEN AS CHAIRMAN OF THE TVA CONGRESSIONAL CAUCUS. I AM HERE TODAY AS A REPRESENTATIVE OF THE RATEPAYERS. THEY WANTED THE HEARING AND I GAVE IT TO THEM.

TVA HAS CONTRIBUTED SIGNIFICANTLY TO THE PROSPERITY OF THE TENNESSEE VALLEY DURING ITS 61 YEARS OF EXISTENCE. TVA PLAYS A MAJOR ROLE IN THE ECONOMIC GROWTH AND HIGH STANDARD OF LIVING THE TENNESSEE VALLEY RESIDENTS ENJOY AND, TODAY AT TIMES, TAKE FOR GRANTED. TVA IS UNIQUE IN THE WAY IT SINGLEHANDEDLY LIFTED THE TENNESSEE VALLEY REGION OUT OF THE POVERTY AND MISERY THAT EXISTED PRIOR TO THE 1930'S.

AND TVA IS NO LESS UNIQUE TODAY IN BEING THE ONLY UTILITY IN THE COUNTRY BUILDING NUCLEAR POWER PLANTS. NO OTHER UTILITY IN THIS COUNTRY IS BUILDING NEW BASELOAD CAPACITY LIKE TVA, NOT TO MENTION NEW NUCLEAR BASELOAD CAPACITY. AND AS TVA CONTINUES TO EMBARK ON ITS MASSIVE NUCLEAR CONSTRUCTION PROGRAM, THE UTILITY INDUSTRY IS ENTERING A NEW AND MORE COMPETITIVE ERA WHERE MARKET FORCES WILL PLAY A SIGNIFICANT ROLE IN SETTING THE PRICE OF ELECTRICITY.

NEW MARKET FORCES CREATED UNDER THE 1992 ENERGY POLICY ACT ARE DRIVING WHOLESALE POWER RATES DOWN. COMPETITION WITHIN THE UTILITY INDUSTRY IS PROPELLING PUBLIC UTILITY COMMISSIONS AND PUBLIC POWER SYSTEMS TO SHOP AROUND FOR NEW LOW-COST POWER SUPPLIERS.

I COMMEND TVA CHAIRMAN CRAVEN CROWELL'S STATED GOAL WHICH IS STABLE RATES THROUGH 1997. BUT IN THIS ERA OF NEW COMPETITION MAJOR POWER SUPPLIERS HAVE SET AN OBJECTIVE OF REDUCING RATES!

TODAY, TVA IS AT A CROSSROADS. WITH A NEW CHAIRMAN AND A NEW DIRECTOR IN PLACE AND ON THE JOB FOR ALMOST A YEAR NOW, THEY ARE CHARGED WITH SETTING A NEW COURSE FOR TVA. THEY HAVE TRAVELLED THE TENNESSEE VALLEY REGION, THEY HAVE TALKED WITH RESIDENTS, BUSINESSES AND DISTRIBUTORS. THEY HAVE LISTENED TO THE EMPLOYEES. THEY UNDERSTAND THE PAST PROBLEMS AND ISSUES WHICH HAVE PLAGUED THIS AGENCY, AND THEY MUST NOW EMBARK IN PREPARING THIS AGENCY FOR THE 21ST CENTURY.

I KNOW IT IS NOT EASY TO CHANGE TVA'S DIRECTION. TVA HAS INVESTED HUGE SUMS IN ITS NUCLEAR UNITS. WITH SO MUCH INVESTED, DO YOU COMPLETE THE UNITS AND HOPE YOU CAN GET A RETURN ON THEIR INVESTMENT OR DO YOU MOTHBALL THEM AND CUT YOUR LOSSES? THESE ARE TOUGH QUESTIONS WITH NO EASY ANSWERS. HOWEVER, THESE ISSUES MUST BE ADDRESSED NOW.

THE HEARING TODAY WILL FOCUS ON THE NUCLEAR PROGRAM - WHAT IS THE STATUS OF THE UTILITY'S NUCLEAR PROGRAM AND WHERE IS IT HEADING IN

THE FUTURE. WE HOPE TO LEARN MORE ABOUT TVA'S DEBT. SPECIFICALLY, HOW IT RELATES TO THE NUCLEAR PROGRAM, HOW IT EFFECTS FUTURE RATES, AND WHETHER THE DEBT HANDICAPS TVA IN COMPETING WITH OTHER UTILITIES THAT DO NOT CARRY SUCH LARGE DEBT. FINALLY, WE WANT TO EXPLORE IN GREATER DETAIL THE INTEGRATED RESOURCE PLAN TVA MUST COMPLETE.

LET ME TAKE THIS OPPORTUNITY TO ADDRESS EACH OF THESE ISSUES SEPARATELY.

TVA'S NUCLEAR PROGRAM

WHILE EVERY OTHER UTILITY HAVE WALKED AWAY FROM NUCLEAR AS A VIABLE ECONOMICAL OPTION TO PRODUCE POWER, TVA STILL CONTINUES TO EMBARK ON THE LARGEST NUCLEAR CONSTRUCTION PROGRAM IN THE COUNTRY. IN THE TWO CHARTS PREPARED BY TVA I HAVE ATTACHED TO MY STATEMENT, IT IS CLEAR THAT THEY PLAN TO MEET ALL FUTURE LOAD GROWTH WITH NUCLEAR POWER. I HAVE ALWAYS ADVOCATED THAT THERE IS STRENGTH IN ENERGY DIVERSITY. HOWEVER IN TVA'S CASE, THERE APPEARS TO BE NO CONSIDERATION GIVEN TO ENERGY CONSERVATION, NATURAL GAS, COAL, OIL, SOLAR, OR HYDRO. NUCLEAR IS THE ONLY OPTION TVA IS CONSIDERING. ALL THEIR EGGS ARE IN ONE BASKET. IN MY VIEW THAT'S NOT GOOD FOR THE RATEPAYERS IN THE TENNESSEE VALLEY.

TVA STATES THAT THE FUTURE OF BROWNS FERRY UNIT 1, WATTS BAR UNIT 2 AND BELLEFONTE UNITS 1 AND 2 WILL BE DETERMINED BY THE INTEGRATED RESOURCE PLAN. IN MY VIEW, ALL NINE UNITS SHOULD BE EVALUATED AS PART OF THE INTEGRATED RESOURCE PLAN.

WHY? BECAUSE EVEN WHEN NUCLEAR POWERPLANTS GO ONLINE, THEIR FUTURE IS UNCERTAIN. SINCE 1989, SIX NUCLEAR POWER PLANTS HAVE BEEN RETIRED EARLY, WELL BEFORE THE EXPIRATION OF THE 40-YEAR OPERATING LICENSES. AND MANY OTHER UTILITIES ARE EXAMINING THE ECONOMICS OF CONTINUED OPERATION VERSUS EARLY RETIREMENT OF THEIR NUCLEAR UNITS.

WATTS BAR UNIT ONE IS AN EXCELLENT EXAMPLE. AS SOON AS WATTS BAR UNIT 1 IS LICENSED, THE \$6.5 BILLION COST OF BUILDING THAT PLANT WILL BE INCLUDED IN THE RATE BASE. TVA HAS SAID THAT WATTS BAR WILL RUN AT 80% PLUS CAPACITY DURING ITS LIFE CYCLE. I CAN ONLY HOPE TVA IS RIGHT. WATTS BAR MUST RUN EFFICIENTLY IN ORDER TO GENERATE ENOUGH REVENUE TO AVOID ANY RATE INCREASE. HOWEVER, GIVEN THE WAY TVA HAS OPERATED NUCLEAR PLANTS IN THE PAST, I AM LESS THAN OPTIMISTIC THAT IT CAN BE DONE.

WHEN I WAS AT THE TVA BOARD I WAS A FREQUENT CRITIC OF THE NUCLEAR PROGRAM. IN FACT, I VOTED AGAINST EVERY RATE INCREASE IN AN EFFORT TO FORCE TVA TO CURTAIL ITS NUCLEAR PROGRAM. I BELIEVE THEN THAT THEY WERE OVERPROJECTING THEIR ENERGY FORECASTS AND OVERBUILDING THEIR

NUCLEAR PROGRAM. IN THOSE DAYS, THEY WANTED TO BUILD 17 NUCLEAR REACTORS AT ONE TIME. IN HINDSIGHT IT SEEMS RIDICULOUS THAT TVA WAS GOING TO CONSTRUCT AND OPERATE 17 NUCLEAR POWER PLANTS.

TVA USES ITS LOAD FORECASTS TO JUSTIFY THE NEED TO BUILD NEW NUCLEAR UNITS TO MEET BASELOAD DEMAND. WHEN I WAS ON THE BOARD, THE TVA STAFF GAVE US THEIR DATA AND ANALYSIS AND YOU REALLY HAD NO CHOICE BUT TO ACCEPT THE INFORMATION. THE BOARD SIMPLY DID NOT HAVE THE STAFF NOR THE RESOURCES AVAILABLE TO GENERATE INDEPENDENT DATA, AND THUS MAKE, IN MY VIEW, A TRULY INFORMED DECISION.

WITH RESPECT TO TVA'S LOAD FORECASTS, THEY HAVE NEVER BEEN ACCURATE. EVEN TVA'S CURRENT LONG-TERM LOAD FORECAST OF 2.3% IS HIGHER THAN LOAD FORECASTS PREDICTED IN THE STATES OF FLORIDA AND TEXAS. IS TENNESSEE GOING TO GROW FASTER THAN FLORIDA, FASTER THAN TEXAS? I HOPE SO BUT I DON'T THINK SO. THAT IS WHY IT IS SO IMPORTANT THAT INDEPENDENT DATA BE USED TO CONFIRM TVA'S DATA DURING THE INTEGRATED RESOURCE PLANNING PROCESS TO ENSURE THE RELIABILITY AND OBJECTIVITY OF THE IRP.

TVA'S DEBT

ITS NO SECRET THAT MUCH OF TVA'S DEBT IS ASSOCIATED WITH ITS NUCLEAR PROGRAM. A SIGNIFICANT AMOUNT OF TVA'S DEBT IS NOT YET IN THE RATEBASE. ACCORDING TO THE LATEST FIGURES I HAVE, TVA'S TOTAL DEBT IS \$25.3 BILLION, NOT COUNTING THE SO-CALLED DEFEASED DEBT OF \$4.5 BILLION. OF THE \$25.3 BILLION TOTAL DEBT, \$6.1 BILLION SPENT ON WATTS BAR UNIT 1, \$1.6 BILLION SPENT ON WATTS BAR UNIT 2, AND THE \$4.5 BILLION SPENT ON THE BELLEFONTE UNITS ARE NOT IN THE RATE BASE. THAT IS ONE OF THE REASONS TVA HAS NOT HAD TO RAISE RATES.

EVENTFULLY THIS DEBT MUST BE PAID FOR BY THE RATEPAYERS. AND IF TVA DECIDES TO COMPLETE WATTS BAR UNIT 2 AND BELLEFONTE, ADD ANOTHER \$5 BILLION TO THE RATE BASE. ONCE THESE NUCLEAR UNITS RECEIVE A COMMERCIAL LICENSE OR TVA DECIDES TO MOTHBALL THEM, THE BILLS COME DUE FOR THE TENNESSEE VALLEY RATEPAYER.

UNDER THE TVA ACT, THE TVA BOARD HAS THE AUTHORITY TO RAISE RATES TO MEET ITS EXPENSES. BUT GIVEN THE INCREASINGLY COMPETITIVE ENVIRONMENT OF UTILITIES BEING ABLE TO WHEEL LOW-COST POWER, TVA CANNOT JUST RAISE RATES. THEY WILL LOSE CUSTOMERS AND THE TENNESSEE VALLEY REGION WILL LOSE PRECIOUS JOBS.

CITIES THAT ARE LOCATED AT THE OUTER EDGES OF THE TENNESSEE VALLEY REGION WILL BE WOODED BY LOW COST POWER PRODUCERS SHOULD TVA RAISE ITS RATES. THIS HAS ALREADY OCCURRED IN CITIES LIKE BRISTOL AND MEMPHIS. YET OTHER CITIES LOCATED DEEPER IN TVA'S SERVICE REGION, CITIES LIKE NASHVILLE ARE CAPTIVE TO TVA'S RATES. THEY HAVE NOWHERE TO TURN SINCE

OTHER UTILITIES WOULD NOT WANT TO INVEST THE MONEY NECESSARY TO BUILD THE ELECTRIC POWER LINES NEEDED TO SERVE CITIES LIKE NASHVILLE.

AS I SEE IT, THE NEW BOARD HAS INHERITED LIMITED OPTIONS. CLEARLY, TVA HAD ALREADY INVESTED HUGE SUMS IN ITS NUCLEAR POWER PLANTS WHEN CHAIRMAN CROWELL AND DIRECTOR HAYES JOINED THE BOARD. THE BOARD REALIZES THAT WITH SO MUCH INVESTED IN THESE NUCLEAR UNITS, IT MAKES ECONOMIC SENSE TO INVEST JUST A LITTLE MORE TO FINISH THE PLANTS. EVENTUALLY, HOWEVER, THE BILLS MUST BE PAID FOR THE ONLY WAY POSSIBLE - THROUGH HIGHER REVENUES.

TVA'S INTEGRATED RESOURCE PLAN

THE TVA CONGRESSIONAL CAUCUS IS VERY INTERESTED, AND WILL BE VERY INVOLVED, IN THE INTEGRATED RESOURCE PLAN THAT TVA IS REQUIRED TO PREPARE UNDER THE 1992 ENERGY POLICY ACT.

THE 1992 ENERGY ACT REQUIRES TVA TO CONDUCT A LEAST-COST PLANNING PROGRAM WHICH "EVALUATES THE FULL RANGE OF EXISTING AND INCREMENTAL RESOURCES IN ORDER TO PROVIDE ADEQUATE AND RELIABLE SERVICE TO ELECTRIC CUSTOMERS IN THE TENNESSEE VALLEY AUTHORITY AT THE LOWEST SYSTEM COST."

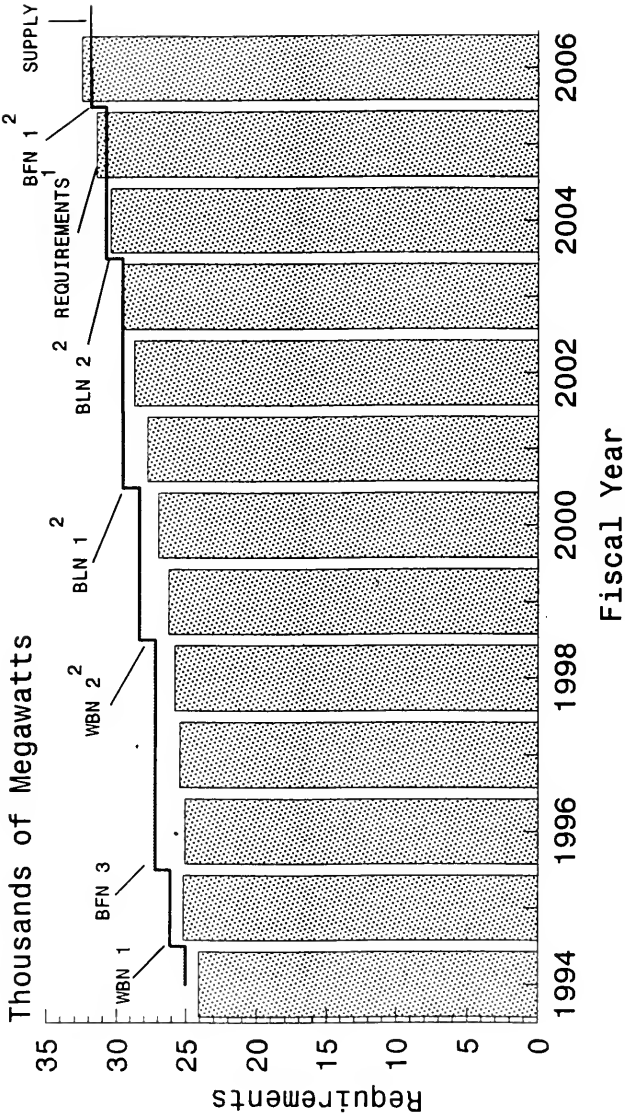
AS PART OF THE IRP PROCESS, TVA WILL CREATE A 15 TO 20 MEMBER REVIEW GROUP MADE UP OF OUTSIDE INTERESTED PARTIES TO ACT LIKE A PUBLIC UTILITY COMMISSION TO QUESTION, COMMENT AND MAKE SUGGESTIONS TO IMPROVE THE PLAN. THEIR ROLE IS CRITICAL AND THE ABILITY THEY HAVE TO GENERATE INDEPENDENT DATA, INDEPENDENT OF TVA'S OWN ANALYSIS AND STUDIES, IS CRUCIAL TO A SUCCESSFUL AND ACCEPTABLE INTEGRATED RESOURCE PLAN.

IN SUMMATION, I URGE THE TVA BOARD TO PLACE ALL NINE NUCLEAR UNITS WITHIN THE SCOPE OF THE INTEGRATED RESOURCE PLAN. FURTHERMORE, I CALL ON THE BOARD TO PROVIDE THE FUNDING NECESSARY FOR THE REVIEW GROUP TO COMMISSION THEIR OWN STUDIES TO CONFIRM, CORROBORATE AND VERIFY TVA LOAD FORECASTING AND LOW COST-POWER ALTERNATIVES. THAT IS THE ONLY WAY TVA WILL BE ABLE TO COME UP WITH A TRULY ACCURATE, RELIABLE AND CREDIBLE IRP PLAN ACCEPTABLE TO THE RATEPAYERS OF THE TENNESSEE VALLEY.

THE FUTURE OF TVA WILL BE DETERMINED BY THE INTEGRATED RESOURCE PLAN. AND AS THE FUTURE OF TVA IS DETERMINED BY THE IRP, SO IS THE FUTURE OF ALL THE PEOPLE AND BUSINESSES IN THE TENNESSEE VALLEY WHO DEPEND ON TVA TO PROVIDE LOW-COST AND DEPENDABLE ENERGY.

I WANT TO THANK OUR DISTINGUISHED WITNESSES FOR COMING TO WASHINGTON TODAY. I LOOK FORWARD TO THEIR TESTIMONY.

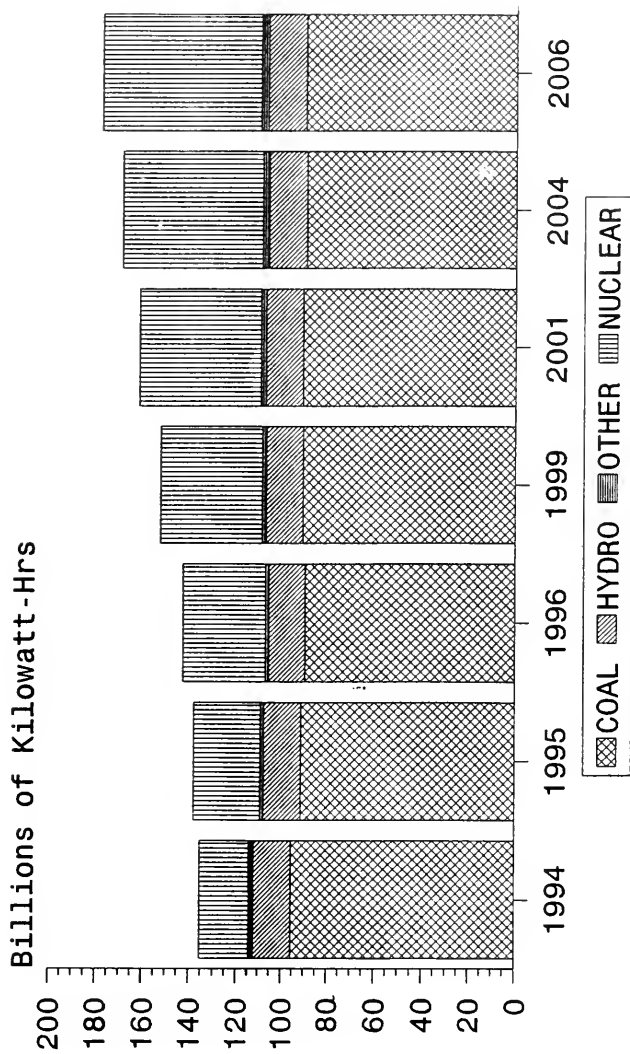
Long-Term Capacity and Supply



NOTES:

1. Requirements = Peak Load + Desired Reserves
2. Assumes confirmation through Integrated Resource Plan

NET ENERGY GENERATION





CHATTANOOGA AREA URBAN LEAGUE

730 Martin Luther King Boulevard • P.O. Box 11106 • Chattanooga, Tennessee 37401 • 615.756.1762 • Fax 615.267.2622

January 26, 1994

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Craven Crowell, Board Chairman
Tennessee Valley Authority
400 West Summit Hill Drive ET 12B
Knoxville, TN 37902

Charles E. Love
President

Dear Chairman Crowell:

I greet you on behalf of the Tennessee Urban League affiliates in Chattanooga, Memphis, Nashville, and Knoxville, Tennessee. Combined we represent some 400,000 constituents in the Tennessee Valley. The reason for this letter is in response to the recently announced reorganization of TVA and its management. We are very concerned and disturbed at what appears to be a trend that is all too common in corporate America and in agencies such as TVA. Your commitment to serving the diversity in the valley has been de-emphasized according to the way we view your new organization chart.

You may recall in our meetings with the Tennessee Congressional and Senate delegation in Washington, D.C. last year (July 1993), we voiced our concern about the importance of Diversity Development in TVA, as well as representation at a management level of minorities and women reporting directly to the Board. As a followup to that meeting, and your meeting with the black leadership in Memphis, we thought you were sensitive to these concerns. At the meeting in Memphis you stated that time that their would be equal share in decision-making by minorities regarding the Board. That appears not to be the case in your reorganization. The mission of the Urban League on the national and local level are equality and allocations for fairness: We are concerned that the pattern of TVA is reflective of its history of excluding diversity as an important element in economic development and providing service.

The Urban leagues in Tennessee believes that diversity and profitability go hand-in-hand, and the value of diversity is equal to or greater than the use of electricity. Human worth is the cornerstone of our nation and TVA certainly should be reflective of that value. We would hope that you reconsider carefully your reorganization that shows Diversity Development has been diminished to at best monitoring status, and at least to a position that bears little attention.

An affiliate of the National Urban League
Contributions to the Urban League are tax deductible.

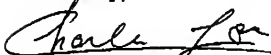
A United Way Agency

Craven Crowell
January 25, 1994
Page 2

If the credibility and integrity of TVA is to be maintained in the eyes of those you serve, diversity and the accomplishments made over the past three years should remain at the level it was before reorganization. In addition, I respectfully request to be placed on the agenda at the next Board meeting to represent the Tennessee Urban League affiliates discussing with the Board this very serious concern.

Thank you for your patients regarding this matter.

Sincerely,



Mr. Charles E. Love
President/CEO

CELWP100:1hb

c: U.S. Senators Harlan Matthews
Jim Sasser
Congresswoman Marilyn Lloyd
Congressmen Harold Ford
Jim Cooper
Bob Clement
John Tanner
Bart Gordon



Holland & Associates

The Utility Consulting Professionals

February 28, 1994

Congressman Bob Clement
Chairman, TVA Congressional Caucus
Room 1230
Longworth House Office Building
Washington, DC 20515-4205

Dear Bob:

Thank you for the opportunity to participate in the upcoming joint hearing, March 9, 1994, on the Tennessee Valley Authority. Holland & Associates is a utility consulting firm and therefore vitally interested in all matters which affect TVA. We want to express our appreciation for the kind and considerate hand you and your staff extended to Holland & Associates and our clients concerning the Economy Surplus Power Program offered by TVA. The Economy Surplus Power Program and new rate structures under design by TVA at this time are of paramount concern to all major industries in the valley.

Listed are general questions that are repeatedly asked by the larger commercial and industrial users.

1. Why has the ESP Program been limited to only 5000 KW and larger users as of October 29, 1993?

Comment: The ESP Program is one of the best designed rate programs in the Southeast as it incorporates advanced energy purchasing, time of day pricing, and curtailability. This program is equally good for TVA and the customers who are on the rate. The incremental hourly pricing of ESP energy always guarantees a profit margin for TVA whether they are generating the power or buying from other utilities. During the summer of 1993 and the winter of 1994, TVA has recovered millions of dollars from its ESP rate payers during the high energy cost times due to the pass through provision of the ESP Program. In addition, TVA may curtail their ESP customers any time power is not available from any source as they did in January of 1994.

Since each ESP customer pays the same \$1,500 customer service charge each month as well as the same \$1,075 computer connection charge, there should be no reason to limit the KW size of an ESP customer to 5000 KW. The mere economics of a customer being able to handle the \$1,500 and \$1,075 monthly charges already limits the KW size of who can apply for the rate.

Page Two

The ESP Program is bringing a lot of new industry to the valley and quite a lot of existing industries are expanding their operations due to the Program. It needs to be continued for everyone.

2. What is the reasoning behind TVA's decision to require any customer under 5000 KW to leave the ESP system whenever their contracts run out in two to three years?

Comment: These customers have already been properly operating under the ESP guidelines and have an outlay of monies on such items as computerized load monitoring, primary and secondary switches, power factor correction, lease/purchase of distribution transformers, and lease/purchase of standby generation equipment. They should be grandfathered in to remain on the ESP Rate.

3. Why has ESP energy pricing been so high from summer of 1993 through the winter of 1994?

Comment: High ESP energy costs due to extreme temperatures in summer and winter are understandable. However, ESP energy prices remained much higher than normal even through the fall of 1993 when moderate temperatures were occurring. TVA would seem to be tight on their power generation capability when they should have plenty of excess generation available. Why is this occurring?

4. TVA is presently developing new rates for customers under 5000 KW as a replacement for the ESP rate. What new saving opportunities will be realized versus those which already exist with ESP?

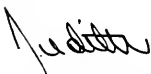
Comment: If these rates do not offer similar savings to the existing ESP program, there will be many distressed customers under 5000 KW who will feel discrimination.

We will be attending the Caucus hearing on March 9th and look forward to our meeting with you on Thursday, March 10th.

Bob, please give us a call if further comments or insight is needed.

Sincerely,

HOLLAND & ASSOCIATES



Judith A. Abernathy

259832



Paul W. Holland, P.E.

267595

Association of Tennessee Valley Counties

P.O. Box 24473, Nashville, Tennessee 37202-4473

615/735-3006

March 7, 1994

The Honorable Bob Clement, Chairman
TVA Congressional Caucus
U. S. House of Representatives
Washington, D. C. 20515-4205

Dear Congressman Clement:

As you know this Association was formed in 1981 to improve the communication and understanding between local governments (201 counties and their respective county seats) in the TVA region and the Tennessee Valley Authority for the ultimate goal of providing more cost effective services including electrical power for the people of the region. Thirty-two (32) chief executives of the counties and municipal governments serve as our board of directors. They represent counties and cities/towns across the seven-state TVA region.

We believe that TVA Chairman Crowell and Directors Hayes and Kennoy have appropriately focused TVA's efforts on keeping rates stable, finding ways to improve our environment, and placing high value on TVA employees. Our Association fully supports TVA's current goals and objectives as set forth by the its board of directors.

Our membership knows that competitive, stable electrical power rates play a vital role in the economic growth of the Tennessee Valley. It is therefore vital that the TVA Board continue on its present course.

We (ATVC) appreciate your role in overseeing and protecting one of the Valley's most important resources, the TVA. We also very much appreciate this opportunity to emphasize to you our support of TVA's mission and current direction.

We know that you, as Chairman of the TVA Congressional Caucus, will do what you can to help the TVA Board achieve its objectives.

Sincerely,



Bill Hafmon, President, ATVC
Sequatchie County Executive

Pascal DiJames
Administrator

Phone: 615-337-4111

Marvin E. Bradford, President

P.O. Box 599
Sweetwater, Tennessee 37874



Charles F. Ashley
Assistant Administrator

Fax: 615-337-6459

Clyde R. Caldwell, Jr., Vice President

TENNESSEE VALLEY TRADES and LABOR COUNCIL

AFFILIATED ORGANIZATIONS

International Association of Heat and
Frost Insulators and Asbestos Workers
International Brotherhood of Boilermakers,
Iron Ship Builders, Blacksmiths,
Forgers and Helpers
International Union of Bricklayers
and Allied Trades
United Brotherhood of Carpenters
and Joiners of America
International Brotherhood of
Electrical Workers

International Association of Bridge,
Structural and Ornamental Iron Workers
Laborers' International Union of
North America
International Association of Machinists
and Aerospace Workers
International Union of
Operating Engineers
International Brotherhood of Painters
and Allied Trades

Operative Plasterers' and Cement
Masons' International Association
United Association of Journeymen
and Apprentices of the Plumbing
and Pipe Fitting Industry
United Union of Roofers, Waterproofers
and Allied Workers
Sheet Metal Workers
International Association
International Brotherhood of Teamsters,
Chauffeurs, Warehousemen and Helpers

March 7, 1994

The Honorable Bob Clement
U.S. House of Representatives
1230 Longworth House Office Building
Washington, DC 20515-4205

Dear Mr. Clement:

I am writing you in connection with the March 9 oversight hearings of the Tennessee Valley Authority to express the views of the Tennessee Valley Trades and Labor Council. The Council consists of fifteen (15) international unions representing 16,000 TVA trades and labor employees.

TVA is at a crossroads, and the actions it takes during the next several years will largely determine the kind of impacts it will have on a large and important region of the country.

We think the new leadership of TVA is off to the right start. First, they are committed to putting employees first. I know of no organization that operates successfully without a strong base of loyal employees with high morale. Second, they are committed to keeping electric power rates down, and this means "jobs"-jobs with TVA and jobs in all the other construction and manufacturing areas brought about by new and expanded industry in a healthy regional economy. Third, I believe they are committed to a positive and productive relationship with the unions representing TVA employees.

TVA's actions to date show a sincere effort to meet these goals. The Council is committed to making these goals a reality.

I appreciate the opportunity to express the Council's strong support for TVA and its future.

Yours very truly,

Pascal DiJames

Pascal DiJames
Administrator
Tennessee Valley Trades and Labor Council

PD:vc

Fax 202-226-1085

cc: Tennessee Valley Delegation



American Public Power Association

1111 Street NW
Washington, DC 20037-1444
202/462-7800

Electric Utility Trends Affecting
TVA Distributors' Power Supply

Remarks of
Larry Hobart, Executive Director
American Public Power Association
at the Power Supply Committee Meeting
of the Tennessee Valley Public Power Association
Nashville, Tennessee

March 3, 1994

There are a number of trends in the electric utility industry that may affect how you handle power supply in the Tennessee Valley.

Competitive market here. One is the fact that, across the nation, a more competitive wholesale bulk power supply market is developing.

Forces driving this change include continued existence of excess generating capacity on the part of overbuilt utilities, creation of new entities such as independent power producers or IOU-affiliated subsidiaries, continuing interest in industrial and commercial cogeneration, and expanded authority given the Federal Energy Regulatory Commission to order transmission services.

We are not talking about abstract ideas. Things are happening.

For instance, in the Northeast part of the U.S., two small municipal electric systems in New Jersey and Maine recently lowered their wholesale power costs by more than 40% by using transmission access as a bargaining tool.

In another arena, FERC has determined that the Commission can order network access by IOUs in Florida, and additional savings for other public power systems are likely in this contested case.

On the other side of the country, in the Pacific Northwest, consumer-owned electric utilities that have been traditionally dependent on the Bonneville Power Administration's extensive and relatively inexpensive hydroelectric system for all or part of their requirements, are finding other sources may be less costly.

In all parts of the nation there is a reassessment of power supply relationships. The National Electric Reliability Council is considering how it can incorporate non-utility utilities into its operations, and there are pockets of progress in the establishment of regional transmission groups.

Bidding new approach. State public utility commissions and public power systems are increasingly relying on competitive bidding to serve new power supply needs. Contracts as opposed to regulation are becoming the vehicle of choice in determining prices. Present practices for purchasing power are more like a big bazaar than an exclusive outlet -- less monolithic, more heterogeneous. "Long-term" power supply investments made today are measured in periods of 7-10 years as opposed to the 25-30 years considered common in the 1970s.

There is much more interest in buying as opposed to building, and purchases are made in smaller amounts to more closely track load growth.

Utilities are "unbundling" the various components of electric supply and selling them separately; where once the major breakdown was firm and peaking power, now you can buy load shaping, shoulder period, and spot market power. You may also purchase separately scheduling, dispatch, and reserve services.

Organizations have been set up to "broker" power, i.e. buy and sell contracts for future delivery just like commodities traders sell soy bellies and wheat.

Market pricing of wholesale power -- as opposed to rate-setting based on cost-of-service -- is now permitted by FERC where it finds that the seller lacks market power. In an atmosphere driven by markets, there is stronger support for application of the antitrust laws to prevent monopolies. There is a need to protect equitable availability of "essential facilities" like transmission.

prevent barriers to entry, guard against predatory pricing, avoid tie-in sales, curtail discriminatory conduct, block bottleneck control, and root out monopolistic practices.

Distributors not beneficiaries. The significance of these events for TVA distributors is that you are not direct beneficiaries of these changes except on the fringes of the TVA service area. Memphis and Bristol, Virginia, cut deals with TVA to improve their supply situation after threatening to sign up with another bulk power wholesaler, but the 10-year rolling notice period in TVA contracts and the legal barrier to securing wheeling services from TVA keeps most distributors out of "hands-on" involvement in this new competitive bulk power supply market.

On the other hand, in 1992, the Congress charged TVA with a reassessment of its power supply approach. As you know, the National Energy Policy Act requires TVA to conduct a "least-cost planning program" for new energy resources which "evaluates the full range of existing and incremental resources (including new power supplies, energy conservation and efficiency, and renewable energy resources) in order to provide adequate and reliable service to electric customers of the Tennessee Valley Authority at the lowest system cost."

Under the federal law, TVA must "provide an opportunity for distributors of the Tennessee Valley Authority to recommend cost-effective energy efficiency opportunities, rate structure incentives, and renewable energy proposals," and TVA must "encourage and assist such distributors in the planning and implementation of cost-effective energy efficiency options."

In addition, the statute says that before "the selection and addition of a major new energy resource on the Tennessee Valley Authority system, the Tennessee Valley Authority shall provide an opportunity for public review and comment and shall include a description of any such action in an annual report to the President and the Congress."

- 4 -

The TVPPA Power Supply Committee should be actively involved in this process. It could serve as the focal point for TVA interaction with distributors. This is a first-of-a-kind effort by TVA. Congress has told it to work closely with you in accessing a broad spectrum of possibilities, including a key variable -- how much load growth will take place.

While the bulk of TVA distributors are effectively barred from making independent decisions about power supply unless they successfully move to amend existing federal law or void contractual commitments, there are ways for TVA distributors to put on pressure to better their power supply situation as other consumer-owned electric utilities are doing in other parts of the nation.

Giving notice option. For example, you can give notice to TVA that you may wish to pursue other opportunities at the end of 10 years. Four-County Electric Power Association did that in 1993. You have the same opportunity. One result could be a keener awareness on the part of TVA that there are options distributors can exercise and that they may be prepared to employ them.

Ten years is a very long notice time. A goal of distributors could be to negotiate with TVA a shorter notice period that is more in accord with current events.

It is useful to recognize that TVA is driven by its own goals and political responses in putting together its programs. As stated in its 1993 Annual Report, TVA has reaffirmed its commitment "to maintaining competitive rates by not raising additional revenue through rate increases for the next four years." However, some other major power suppliers have set an objective of reducing rates.

You can also consider whether or not the language of Section 212 of the Federal Power Act that bars distributors from securing wheeling services from TVA is a help or a hindrance to you. If you decide that it is a significant block to competitive bulk power supply markets, you may wish to consider seeking an amendment to the statute. In that regard, it is worth noting that an identical obstacle does not exist for preference customers of another major federal power marketing agency -- the Bonneville Power Administration. While BPA is allowed to follow different procedures than other transmission owners, FERC retains the

authority to order BPA to provide transmission service and to establish the terms and conditions of such service. In other words, consumer-owned electric utilities can use BPA's transmission system -- which represents 80% of the region's grid capacity -- to move power from other sources.

BPA has indicated in the past few days its belief that the agency could lose as much as 40% of current power sales by the year 2000 due to competitive forces operating in the Pacific Northwest. This would mean a revenue shortfall of \$600 to \$800 million in the next five years. What are the reasons for such a prospect? BPA's costs are going up, natural gas prices are going down, and independent power producers and self-generation are attractive alternatives. What is the BPA reaction to the situation? The agency is downsizing, eliminating subsidized energy conservation, and setting up differential rates for 23 different market segments.

BPA said last month: "The increase in BPA's costs and the reduction in natural gas prices threatens BPA's historic position as the low-cost, preferred power provider [in the Northwest]. The emergence of independent conservation and resource developers, open-access transmission, deregulation of the electric utility industry, and increased end-user choices clearly end both the ability, and desirability, of BPA maintaining business relationships through restrictive contracts, market dominance, or any other means short of being best value."

In other words, BPA is compelled to compete for markets.

BPA's problems point up another aspect of the current power supply picture of importance to users of the TVA system: Unrestricted environmental mandates can add open-ended costs to a federal power program. In the case of BPA, it is recovery of salmon runs adding in excess of \$1.5 billion to power bills over the last decade with current costs running at the level of \$1 million a day. In addition to higher power bills, the program has resulted in significant loss of generation due to redirection of water for fish flows.

Environmental "de-rating" possible. Federal facilities are frequent targets for environmental fixes; calculation of hydropower losses at existing federal projects outside the Pacific Northwest to achieve fish and wildlife and environmental objectives show that some 2,450 megawatts have disappeared in recent years. Because fixed costs must still be covered, there has been an increase in federal power marketing rates by the Western Area Power Administration, the Southwestern Power Administration, and the Southeastern Power Administration.

Here in the Tennessee Valley, the current environmental focus is on the economic impacts of climate change policies on TVA. TVA staff briefed APPA staff on this question in Washington last week. The results of TVA's analysis are very dependent on assumptions, but it is clear that use of natural gas, coal-mine methane capture, biomass, and reforestation represent meaningful ways to curb greenhouse gas emissions, compared to expansion of coal-fired generation. The question is a double one: What could be the cost to consumers and which entity would be the most effective implementer -- TVA or the distributors?

As you assess your power supply situation in the Valley, it is important to recognize the potential future role of environmental issues on your choices.

A major thrust in this area is toward pollution prevention.

One approach is increased efficiency in energy use so that less pollutants are created; that is where demand-side management and programs like APPA's Tree Power come into play.

A second effort is aimed at closed-loop systems where by-products are recycled rather than discarded; for instance, if scrubber sludge can be profitably used to make wallboard and fly ash employed in creating cement, then the expense and environmental effects of dumping these materials into double-lined pits with leachate collection and groundwater monitoring can be avoided.

A third direction is use of power production techniques that do not create the same type or magnitude of pollutants -- cogeneration, fluidized bed combustion, gas turbines and combined cycle machines, fuel cells that produce power by chemical means without combustion, photovoltaics employing energy from the sun, windmills in areas where velocity is adequate, and biomass, perhaps grown on tree farms.

Differences between small, big. One thing that distinguishes all of these technologies is that they tend to come in smaller modular sizes, have short leadtimes, and lend themselves to distributed generation. In other words, economies of scale are less important and individual distributors might put together economic packages that fit local conditions and needs, including cooperative ventures with commercial and industrial customers.

Another way to look at the overall situation in the Valley is to recognize that TVA has used \$25 billion in debt to help finance 220 fossil, hydro and combustion-turbine units plus nine nuclear generating units completed, under construction, or deferred, and that investment should be utilized, refurbished, and expanded to take care of anticipated Valley-wide needs for power in this decade and into the 21st century. If that is the goal, to keep costs down, what you want to do is keep current customers and sell off-system to spread fixed costs. To do so, you need to go to Congress and break down the TVA "wall." What you cannot tolerate is an "onion peeling" operation where competitors pick off distributors on the edges of the TVA service area with a smaller and smaller core expected to pay for the sunk investment in the overall system, while there is no chance for TVA to compete outside the Valley.

A major question involving this approach is the competitive character of TVA assets. Another major public power supplier, Canada's Ontario Hydro, on which TVA is patterned, decided last month to reduce surplus generating capacity, by nearly 3,000 mw over three years, further downsize its staff, sell off or write off \$200 million in excess equipment, and seek off-system spot sales of power at cost-cutting prices. Load growth has failed to absorb Ontario Hydro's new and most expensive capacity. Among its economic problems: "brittle" nuclear power plants with reliability and price problems.

Nuclear remains a potential problem for TVA and its distributors. Nine units need to be evaluated in the agency's IRP. Yet to be completed are Watts Bar 1 and 2 and Bellefonte 1 and 2. As TVA's 1993 Annual Report states: "All units not operating are expected to be completed as indicated. TVA recently began development of an integrated resource plan that will be utilized to determine the least-cost method of meeting future customer energy demands. The results of this plan, as well as other circumstances, could alter the current planning dates for nuclear completions. If abandonment of any of these units should occur, TVA would recover these costs (including fuel) through rates charged to future customers."

Unlike IOUs subject to "prudence reviews," which can result in shareholders rather than ratepayers absorbing the cost of nonproducing assets, distributors with TVA contracts will be expected to pay for the TVA plants whether or not they produce revenues. Nuclear units come in large lumps, so significant sums could be involved.

Nuclear future "unclear." Last fall, the Congressional Office of Technology Assessment asserted in a 183-page report "Aging Nuclear Power Plants: Managing Plant Life and Decommissioning" that the long-term prospects for the 107 operating plants supplying more than 20% of the nation's electricity are "increasingly unclear." Since 1989, six nuclear power plants have been retired early, well before the expiration of the 40-year operating licenses granted by the Nuclear Regulatory Commission. According to OTA, the owners of an increasing number of plants are examining the economics of continued operation versus early retirement as well in the face of growing competition in the electric utility industry.

However, judging the industry by early retirements, says OTA, may give a misleadingly dim view of the remaining lives of other nuclear power plants because of the great diversity among plants and changing electricity market conditions. OTA finds that no single development is likely to affect uniformly the future of the nation's existing nuclear power plants. Their future is likely to be determined individually over time on a host of separate decisions made by utilities, state utility commissions, and federal regulators.

On the plus side, OTA finds that average nuclear power plant operating and maintenance costs have decreased in recent years, reversing a decades long trend of rapid increase. In addition, average plant reliability has improved substantially.

Safety performance has also been good. No core damage accidents have occurred since Three Mile Island in 1979, nor an abnormal number and severity of events that could have led to core damage, much less any actual offsite releases of large amounts of radioactivity, says OTA. Average occupational radiation exposures, already well below NRC limits, have also declined substantially.

No insurmountable industry-wide safety challenges related to nuclear power plants have been identified, says OTA. Current and planned nuclear power plant aging management practices are designed to identify and address challenges before they become a threat and to provide a reasonable assurance of adequate safety. However, some risk will always remain, says OTA, and continued industry and federal regulatory vigilance is crucial.

Because of the industry's youth, experience with nuclear power plants in the second half of their 40-year licensed lives is limited. This factor can be particularly important, says OTA, for some major long-lived equipment such as the reactor pressure vessel, cables, and piping that are intended to function for the full life of a facility.

In several decisions to retire nuclear plants early, aging degradation and its effects on costs and performance played a prominent role, says OTA. Other major factors include rising operational costs; radioactive waste disposal; public attitudes toward nuclear power; and the changing electric industry context, including increased competition and attention to environmental impacts. However, OTA finds the economy of most nuclear power plants appears at least moderately attractive, assuming the recent leveling of costs continues.

Federal activities in such areas as nuclear waste disposal and plant safety regulation can have major economic impacts. Accelerating these federal efforts could help reduce uncertainty facing utilities and state utility

commissions as they make plant life decisions, says OTA. Federal policies that address climate change and other environmental challenges can also have major impacts on the economics of existing nuclear plants.

Cost comparisons required. Your annual collective power bill in 1993 was \$4.5 billion. The bottom line for TVA distributors is whether or not bulk power supply purchases from TVA -- far and away the major cost of delivered electricity in the Valley -- will be competitive with alternative sources. This is important because distributors, like electric utilities of all ownerships, currently face the challenge of retail competition. There is increased scrutiny of rates and service by communities concerned about family budgets and local jobs. Among other things, failure to pass the test can mean loss of industrial customers, inability to attract new business development, or transfer of the franchise to another system.

You set your rates subject to TVA rules, including allocation of the low-cost hydropower. None of the other 1,000 preference customers who buy power from federal power marketing agencies are subject to such control. As you deal with power supply, you should consider working for full freedom to charge prices that fit your community's needs.

All these things make the work of the TVPPA Power Supply Committee very important. What happens to power supply affects the interests of 160 municipal and cooperative power distributors serving more than 7 million people in an 80,000-square-mile region touching seven states.

Let me close with seven quick points:

1. The power supply game today is less like a chess game and more like a video game in terms of its speed and volatility.
2. In studying the power supply situation in the Valley, TVA distributors need to focus on the main party of interest: retail consumers.

3. Price of power is a major concern for users, but they are also interested in reliability, adequacy, safety, quality, and environmental compatibility.
4. What is going on in the world outside the Valley cannot be ignored; you do not live in a cocoon isolated from competitive factors.
5. Numbers provided by TVA engineers and economists are helpful measures of what is going on, but they need to be regarded with objective dispassion and judged by common sense political assessments.
6. Even if it costs you some money, you should have your own independent experts to help you establish and assess the facts.
7. And lastly, just because you have always done things the way they are done now is not in itself a reason to keep on doing them that way.



BESSEMER UTILITIES

MUNICIPALLY OWNED
POST OFFICE BOX 1246
BESSEMER, ALABAMA 35021

Bessemer Water Service



Bessemer Electric Service
TVA

March 7, 1994

Mr. Bob Clement
Chairman
TVA Congressional Caucus

Dear Mr. Clement,

The City of Bessemer, Alabama was incorporated in the year 1888. In 1890 the City created Bessemer Electric Service to establish an electrical distribution system. In 1938 Bessemer became a TVA distributor. In the 60's private power tried to get Bessemer Electric Service dissolved. In 1971 after several years in court the City prevailed in remaining a TVA distributor.

Once again private power has become a problem. Our city will give tax incentives and loans to new industries. However, most likely they will not be served by the city's own electrical utility, because of cherry picking by private power.

Bessemer is a low income area with high unemployment and few job opportunities. Most residents are employed in Birmingham, Al 15 miles away. TVA customers are 58% black. We have a black Mayor, four black council and three white council members.

1600 First Avenue, North • (205) 481-4333

Bessemer is located only 15 minutes from the new Mercedes Benz plant which will employ 2,000 people. We already have seven industrial parks. Industrial studies refer to our area as a "Sleeping Giant."

TVA has assisted Bessemer greatly in the past in many areas. The most important have been:

1. Urban renewal and community development
2. Energy conservation & management
3. Marketing
4. Engineering services

If TVA were not allowed to assist Bessemer Electric Service the long struggle of the residents of Bessemer would be in vain. If it were not for TVA, Bessemer would be served by private power.

It is hard for TVA employees and people outside of Bessemer to understand the devotion residents have toward their utility. For example, out of 13,000 customers we only have collector. Our bad debt is 1/2 of 1%. Other TVA distributors can not understand why, when almost 100% of our customers receives government checks or live from week to week. If it were not for TVA, Bessemer would most likely be like several other cities in western Jefferson County having to merge with Birmingham. TVA power has kept this from happening but not without resistance from private power.

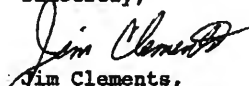
I have been with Bessemer Electric Service for 17 years. For 15 of those years I have tried to understand the reason for the 1920 law that restricts TVA and its distributors areas. The original concept of TVA was for flood control and improving the standard of living in Tennessee Valley.

Why does the U.S. Congress put restraints on TVA? Why can't TVA compete in the open market for customers? Why can't TVA assist in developing counties in Alabama such as: Dallas, Lowndes, Montgomery, Wilcox, Butler and other South Central counties? Private power has done nothing toward development over the past 30 years.

To eliminate the 30 billion dollar deficit just extend to TVA the same privilege any other company in the United States has. The success of the United States has been competition. TVA has the power producing capabilities, availability, the development expertise, and experience. Why not let TVA assist underdeveloped cities in Alabama? PRIVATE POWER HASN'T!

Unleash the power of TVA and let us grow with the proud legacy already handed to us by TV.

Sincerely,


Jim Clements,
Principal Accountant

TENNESSEE VALLEY AUTHORITY
AFRICAN AMERICAN ALLIANCE

Black Managers Association
Blacks In Government, Chattanooga/Knoxville
African American Equality Congress, Agency-Wide
CAC-National Society of Black Engineers

March 8, 1994

The Honorable Bob Clement
Congress of the United States
House of Representative
Longworth House Office Building
Washington, DC 20515-4205

Dear Mr. Congressman:

Thank you for inviting us to share our (TVA) concerns with you through your constituent, Mr. William J. Washington of Waverly, TN. TVA's African-American Alliance is an organization dedicated and committed to equal employment for all employees with an emphasis on African-Americans. We firmly believe the success of this agency rest unequivocally with the collective efforts of a meaningful business partnership between the Board of Directors, employees, and the community in which it serves.

TVA has a long history of ignoring and denying African-American participation in the decision-making process. There are few African-Americans in key policy or executive-level positions in TVA. In fact, of 65 federal agencies with 500 or more employees, TVA ranks 65th in the hiring, promotion, and training of African-American employees. These statistics are verifiable in the Equal Opportunity Commission's (Office of Federal Sector Programs) Report as of fiscal year-ending September 30, 1990.

Currently, the African-American community, as well as members of other ethnic communities, have been set back significantly in history. The actions of the new Board of Directors do not demonstrate the views of the President of the United States of America, the very person responsible for their appointments. The President's cabinet appointments were very indicative of not only how he views America, but more strongly, how he envisions America in a competitive world.

Prior to February 7, 1994, this agency witnessed for the first time in its 58-year history, the appointment of the agency's first African-American Vice-President, who for the last two and half years reported directly to the Board of Directors. February 7, 1994, was the day TVA stepped back in time and once again displayed an act of apathy to equal and fair representation at the decision/policy-making level.

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March 8, 1994
The Honorable Bob Clement

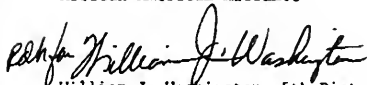
We would be remiss in our observation if we did not acknowledge the appointment of the agency's first position of Senior Vice-President of Training, Education, and Diversity, who is an African-American. While this promotion should be viewed as a positive step, we want to point out to you Mr. Congressman, that this position was diminished from a direct report to the Board, to only "having access." This new position reports to another senior-level manager and in essence places the Diversity Development organization three levels below the Board. Because the issues relative to diversity have a tendency to be somewhat emotional and more complicated than even the issue of keeping rates stable, it is imperative that reporting is at the highest possible level within the organization to improve the aforementioned ranking.

The question becomes why is this so important: The answer Mr. Congressman, is fair representation, relative to gains made by African-Americans as well as females. We can no longer continue to accept ultimatums on how we contribute to the success of this agency, but it is imperative for the Board to approach diversity in a way that the top reflects the community and the workforce in which it serves.

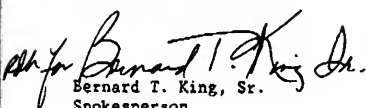
Mr. Congressman, certainly this is not the only concern we have, however, because of time constraints, we respectfully request this concern be addressed and made a part of the official records in your joint hearing. We trust and hope that addressing these issues will make a difference in TVA's overall structure and its approach to diversity.

Respectfully,

TENNESSEE VALLEY AUTHORITY
African-American Alliance



William J. Washington, 5th District, TN
Contact Person
726 Highway 13 North
Waverly, TN 37185



Bernard T. King, Sr.
Spokesperson
3038 Towerway Drive
Chattanooga, TN 37406

TENNESSEE VALLEY POWER CUSTOMERS

*Proposal for
Tax-Exempt Financing Program
To Benefit Customers of
Tennessee Valley Authority*

March 9, 1994

Remarks of William S. Owen To:
United States Congress
Subcommittee on Investigations
and Oversight of the Committee on
Public Works and Transportation
and
The Tennessee Valley Authority Caucus

PROPOSAL FOR TAX-EXEMPT FINANCING PROGRAM TO BENEFIT CUSTOMERS OF TENNESSEE VALLEY AUTHORITY

The purpose of this statement is to generally describe a concept available to the customers of Tennessee Valley Authority (TVA) to realize significant cost savings by accessing lower rate tax-exempt financing for a portion of TVA's capital requirements and to discuss the opportunities available at this time to implement such a tax-exempt financing program. Tax-exempt financing offers TVA and its customers approximately 2 percentage points lower interest rates than comparable taxable financing raised by TVA based upon current long-term market rates.

Over the previous 6 years TVA has significantly lowered its debt interest rate by accessing the corporate capital markets for both new financings and re-financings. This has resulted in savings of hundreds of millions of dollars for TVA ratepayers. Entering the tax-exempt capital markets in a targeted manner is the next logical step in the continuing effort to acquire capital at the most competitive rates.

Outlined below is a financial framework which can provide substantially lower cost financing to benefit TVA's customers through the establishment of a "Joint Action Agency." I have undertaken a preliminary review of the Federal tax and state law issues necessary to implement the proposed financing program. The investigation has focused initially on a tax-exempt financing program in Tennessee only, but if successful in Tennessee, the program could be expanded to benefit additional TVA customers. In fact, legislation of the type needed to provide the basic authorization required for this proposal is already in effect in several adjoining states and those joint action agencies are providing power to their customers at rates lower than alternative power sources.

ACCESSING TAX-EXEMPT FINANCING

The plan of finance envisions the creation under Tennessee law of a Joint Action Agency or other similar entity whose members would consist of Tennessee municipalities which are full or partial requirements customers of TVA. Current Tennessee law allows for a Joint Action Agency to be established through The Tennessee Municipal League Bond Pool.

The Joint Action Agency would be authorized to issue debt and to sell power and energy to its municipal members. The proceeds of the debt of the Joint Action Agency would be paid to TVA in exchange for an ownership interest in or capacity right to specific generating or transmission facilities presently owned by TVA. The Joint Action Agency would sell the capacity and energy acquired from TVA to its member municipalities pursuant to long-term contracts which are coterminous with the maturity of the tax-exempt bonds. The funds received by TVA for the sale of ownership interest or capacity entitlement could be used by TVA for any lawful purpose, including construction activities or expense reductions for all customers.

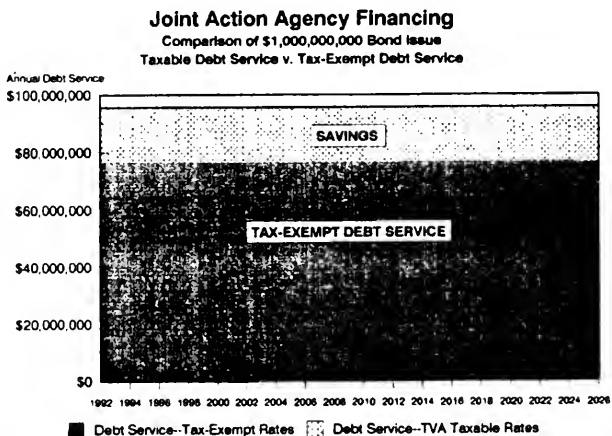
The acquisition of ownership interest or capacity right from TVA would be structured to comply with TVA indenture provisions as well as Federal tax statutes.

Over 60 Joint Action Agencies have been formed in the United States, including several in states where TVA currently sells power. These Joint Action Agencies already provide a source of low-cost financing to the utilities in these states in the same manner contemplated by this proposal. In Georgia, for example, a state-wide Joint Action Agency was formed several years ago to acquire an undivided ownership interest in the generating and transmission facilities of Georgia Power Company. The agency has issued \$2.8 billion of tax-exempt debt and has achieved average power cost savings of 15% - 17%.

Benefits to TVA and Its Customers

One of the primary benefits for TVA and its customers is significantly lower funding costs provided through tax-exempt financing. Over the past decade long-term tax-exempt rates have averaged approximately 2 percentage points less than TVA debt of comparable long-term maturity.

The graph below represents a comparative analysis of annual debt service for a \$1 billion issue at TVA's current long-term borrowing cost and at a Joint Action Agency rate. At this interest rate differential, tax-exempt financing through a Joint Action Agency would save approximately \$15 million - \$20 million each year compared to TVA financing and over a 35 year period, for every \$1 billion issued, could save TVA and its customers between \$680 million and \$1.53 billion depending on issue structure.



The following graph presents current yield curves for both TVA securities and A-rated tax-exempt utility debt. Advantageous interest rate differentials for tax-exempt debt is indicated throughout the of maturities.

In addition to lower interest costs, tax-exempt financing can provide the following benefits:

To TVA:

- Lowers overall capital costs;
- Effectively expands access to different capital markets;
- Reduces debt ceiling constraints;
- Reduces exclusive reliance on taxable debt market.

To TVA's customers:

- Lowers overall power costs, currently and in the future;
- Produces more competitive rates resulting in more competitively priced goods and services;
- Attracts further energy intensive business to the service area.

Major Legal Issues

A preliminary legal analysis of the proposed financing plan has identified the following major issues:

- i) Tax-exempt bonds may be issued to acquire TVA facilities or capacity if undertaken by a "governmental authority" such as a Joint Action Agency.
- ii) The price paid by the Joint Action Agency for facilities or capacity acquired must reflect fair market value.
- iii) Properly structured, as outlined above, the financing would not involve an impermissible benefit to the Federal government.
- iv) TVA would not be limited as to use of funds received from a Joint Action Agency, but could use these funds to the benefit of any of its customers.

Other significant legal issues may arise upon further investigation, but no serious legal impediment appears to pursuit of the proposed tax-exempt financing program.

Tax-Exempt Financing Program Implementation

We believe the interest cost savings offered through tax-exempt financing are compelling and can further TVA's cost reduction and power rate containment objectives.

MAIN POINTS REGARDING JOINT ACTION AGENCY FUNCTION

... The Joint Action Agency contracts with TVA to purchase a capacity right from TVA on agreed terms. Using the capacity right and contracts to resell the power furnished pursuant to the capacity right to member utilities, the Joint Action Agency is able to issue bonds to raise the money needed to pay TVA. The transaction with TVA must be an "arm's length deal", i.e., fair market value must be paid for the capacity right and the JAA must receive fair consideration for providing its credit and tax-exempt status.

... TVA may use the proceeds from the sale of capacity rights for any lawful purpose consistent with its mission. The net savings from the transaction is available to benefit all of TVA's customers as the agency determines without discrimination.

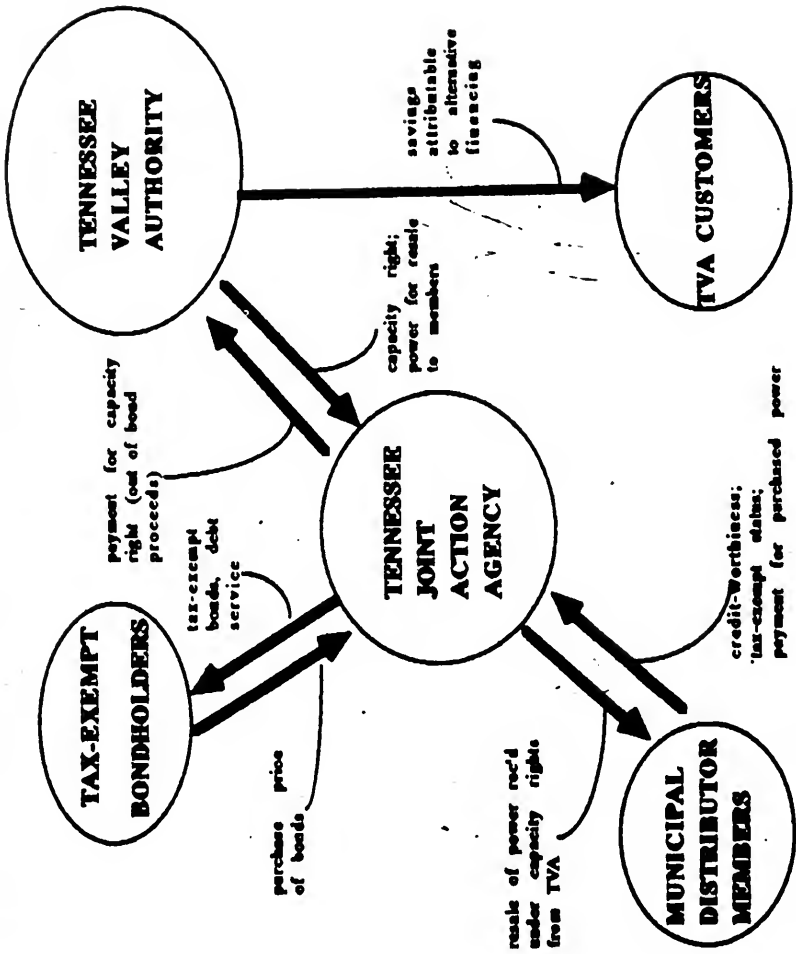
... The resale of power by the Joint Action Agency to municipal member distributors must be at a rate sufficient to provide complete debt service for the bonds issued. The rate charged by the JAA may reflect the benefits of the tax-exempt financing and the value of credit advanced. How these benefits would be passed through to the municipal members would be subject to their contract with the JAA. The benefits could provide for lower power rates, which could be used in various ways, including the creation of incentive programs for commerce, industry or conservation.

... Based upon current market conditions the differential between TVA debt financing and debt issued by the JAA should be 200 basis points (2 percent). For a debt issue of \$1 billion with a term of 30 years, the savings in interest would amount to more than half of the principal amount of the debt or more than \$550 million.

EXPLANATION OF FLOW CHART
TENNESSEE JOINT ACTION AGENCY
**** How the concept works ****

1. The Joint Action Agency, formed by member municipal distributors, issues tax-exempt bonds to pay for a capacity right issued under contract with the Tennessee Valley Authority.
2. The JAA collects the proceeds of the bonds.
3. The JAA uses the bond proceeds to pay TVA pursuant to its contract for the purchase of capacity..
4. TVA then provides power to the JAA from the capacity purchased by the JAA.
5. The JAA sells this power to its member municipal distributors on terms established pursuant to contract between the JAA and the distributors.
6. The members of the JAA pay for the power purchased from the JAA at rates established pursuant to their agreement with the JAA.
7. The proceeds from the sale of power are used by the JAA to fund its debt service and to provide for the administrative expenses of the JAA.
8. Because the tax-exempt financing of the JAA is at favorable rates compared to TVA financing, the TVA is able to reduce its costs and pass the savings back to its customers.

FLOW CHART -- TENNESSEE JOINT ACTION AGENCY



Tennessee Municipal Electric Power Association

William C. "Bill" Moss, Executive Director

March 3, 1994

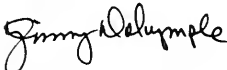
Mr. Jay Hansen
Congressman Bob Clement's Office
Longworth Office Bldg., 1230
Washington, DC 20515-4205

Dear Mr. Hansen:

On behalf of the Tennessee Municipal Electric Power Association Municipal Study Group, we are pleased to provide comments for the TVA Congressional Caucus/Investigation and Oversight Subcommittee hearing concerning the TVA. Our membership represents 42 municipal systems from Alabama, Kentucky, and Tennessee. We have tried to address the three main issues outlined in Congressman Bob Clement's letter to us and, additionally, expressed concerns we have on some other issues as requested. These views are diverse but collectively represent issues of the group in total.

If we can provide any additional information or if you have any questions regarding the matters contained in our comments, please let me, as Vice Chairman of the Municipal Study Group, 747-3895, or Bill Moss, Executive Director of the Tennessee Municipal Electric Power Association, at 373-5738 know.

Sincerely,



James A. Dalrymple
TMEPA
Municipal Rate Study Group

JAD:gd

Mr. CLEMENT. While preparing for the hearing, I was constantly asked "Why are you having a hearing on TVA? What's the purpose of having such a hearing?"

The last time our committee, the authorizing committee for TVA, held a hearing was six years ago, as Chairman Mineta commented. Since TVA is not regulated by any public utility commission, Congress, to a certain degree, must perform that function as best we can to help the board ensure that the interests of the Valley residents are being met.

TVA has contributed significantly to the prosperity of the Tennessee Valley during its 61 years of existence, as mentioned by Congressman Jimmy Duncan. TVA plays a major role in the economic growth and high standard of living that Tennessee Valley residents enjoy and today at times take for granted. TVA is unique in the way it single-handedly lifted the Tennessee Valley region out of the poverty and misery that existed prior to the 1930s.

And TVA is no less unique today in being the only utility in the country building nuclear power plants. No other utility in this country is building new base-load capacity like TVA, not to mention new nuclear base-load capacity. And as TVA continues to embark on its massive nuclear construction program, the utility industry is entering a new and more competitive era where market forces will play a significant role in setting the price of electricity.

New market forces created under the 1992 Energy Policy Act are driving wholesale power rates down. Competition within the utility industry is propelling public utility commissions and public power systems to shop around for new, low-cost power suppliers. I commend TVA Chairman Craven Crowell and the other two board members. Chairman Crowell has stated TVA's goal, which is stable rates through 1997. But in this era of new competition, major power suppliers have set an objective of reducing rates.

Today, TVA is at the cross-roads. With a new chairman and another new board member, Mr. Johnny Hayes, as well as Mr. Kennoy, who has been on there for several years from the State of Kentucky, they are charged with setting a new course for TVA. They have travelled the Tennessee Valley region, they've talked with residents, businesses, and distributors. They have listened to the employees. They understand the past problems and issues which have plagued this agency. They must now embark in preparing this agency for the 21st Century. I compliment them highly for travelling the seven State region as extensively as they have.

I know it is not easy to change TVA's direction. TVA has invested huge sums in its nuclear units. With so much invested, do you complete the units and hope you can get a return on investment? Or, do you mothball them and cut your loses? These are tough questions with no easy answers. However, these issues must be addressed now.

The hearing today will focus on the nuclear program. What is the status of the utility's nuclear program and where is it heading in the future? We hope to learn more about TVA's debt; specifically, how it relates to the nuclear program, how it affects future rates, and whether the debt handicaps TVA in competing with other utilities that do not carry such large debt. Finally, we want to explore in greater detail the Integrated Resource Plan TVA must complete.

Let me take this opportunity to address each of these issues separately. TVA's nuclear program. While every other utility has walked away from nuclear as a viable economical option to produce power, TVA still continues to embark on the largest nuclear construction program in the country. In the two charts prepared by TVA I have attached to my statement, it is clear that they plan to meet all future load growth with nuclear power. I have always advocated that there is strength in energy diversity. However, in TVA's case, there appears to be no consideration given to energy conservation, natural gas, coal, oil, solar, or hydro. Nuclear is the only option TVA is considering. All their eggs are in one basket. In my view, that is not good for the ratepayers in the Tennessee Valley.

TVA states that the future of Browns Ferry unit 1, Watts Bar unit 2, and Bellefonte's units 1 and 2 will be determined by the Integrated Resource Plan. In my view, all nine units should be evaluated as part of the Integrated Resource Plan. Why? Because even when nuclear power plants go on line, their future is uncertain. Since 1989, six nuclear power plants have been retired early, well before the expiration of the 40 year operating licenses. And many other utilities are examining the economics of continued operation versus early retirement of their nuclear units. Watts Bar 1 is an excellent example. As soon as Watts Bar 1 is licensed, the \$6.5 billion cost of building that plant will be included in the rate base. TVA has said that Watts Bar will run at 80 percent plus capacity during its life cycle. I can only hope TVA is right. Watts Bar must run efficiently in order to generate enough revenue to avoid any rate increase. However, given the way TVA has operated nuclear plants in the past, I am less than optimistic that it can be done.

When I was at the TVA board I was a frequent critic of the nuclear program. In fact, I voted against every rate increase in an effort to force TVA to curtail its nuclear program. I believed then that they were over-projecting their energy forecast and over-building their nuclear program. In those days they wanted to build 17 nuclear reactors at one time. In hindsight, it seems ridiculous that TVA was going to construct and operate 17 nuclear power plants.

TVA uses its load forecast to justify the need to build new nuclear units to meet base load demand. When I was on the board, the TVA staff gave us their data and analysis and you really had no choice but to accept the information. The board simply did not have the staff nor the resources available to generate independent data and thus make, in my view, a truly informed decision.

With respect to TVA's load forecast, they have never been accurate. Even TVA's current long-term load forecast of 2.3 percent is higher than load forecasts predicted in the States of Florida and Texas. Is Tennessee going to grow faster than Florida, faster than Texas? I hope so but I don't think so. That's why it is so important that independent data be used to confirm TVA's data during the integrated resource planning process to ensure the reliability and objectivity of the IRP.

TVA's debt. It is no secret that much of TVA's debt is associated with its nuclear program. A significant amount of TVA's debt is not yet in the rate base. According to the latest figures I have, TVA's

total debt is \$25.3 billion, not counting the so-called defeased debt of \$4.5 billion.

Of the \$25.3 billion total debt, \$6.1 billion spent on Watts Bar 1, \$1.6 billion spent on Watts Bar 2, and the \$4.5 billion spent on the Bellefonte units are not in the rate base. That is one of the reasons TVA has not had to raise rates. Eventually, this debt must be paid for by the ratepayers. And if TVA decides to complete Watts Bar 2 and Bellefonte, add another \$5 billion to the rate base. Once these nuclear units receive a commercial license or TVA decides to mothball them, the bills come due for the Tennessee Valley ratepayer.

Under the TVA Act, the TVA board has the authority to raise rates to meet its expenses. But given the increasingly competitive environment of utilities being able to wheel low-cost power, TVA cannot just raise rates. They will lose customers and the Tennessee Valley region will lose precious jobs. Cities that are located at the outer edges of the Tennessee Valley region will be wooed by low-cost power producers should TVA raise its rates. This has already occurred in cities like Bristol and Memphis. Yet, other cities located deeper in TVA service region, cities like Nashville, are captive to TVA's rates. They have nowhere to turn since other utilities would not want to invest the money necessary to build the electric power lines needed to serve cities like Nashville.

As I see it, the new board has inherited limited options. Clearly, TVA had already invested huge sums in its nuclear power plants when Chairman Crowell and the other two directors joined the board. The board realizes that with so much invested in these nuclear units it makes economic sense to invest just a little more to finish the plants. Eventually, however, the bills must be paid for the only way possible, through higher revenues.

TVA's Integrated Resource Plan. The TVA congressional caucus is very interested and will be very involved in the Integrated Resource Plan that TVA is required to prepare under the 1992 Energy Policy Act. The 1992 energy act requires TVA to conduct a least-cost planning program which evaluates the full range of existing and incremental resources in order to provide adequate and reliable service to electric customers in the Tennessee Valley authority at the lowest system cost.

As part of the IRP process, TVA will create a 15 to 20 member review group made up of outside interested parties to act like a public utility commission to question, comment, and make suggestions to improve the plan. Their role is critical and the ability they have to generate independent data, independent of TVA's own analysis and studies, is crucial to a successful and acceptable Integrated Resource Plan.

In summation, I urge the TVA board to place all nine nuclear units within the scope of the Integrated Resource Plan. Furthermore, I call on the board to provide the funding necessary for the review group to commission their own studies to confirm, corroborate, and verify TVA load forecasting and low cost power alternatives. That is the only way TVA will be able to come up with a truly accurate, reliable, and credible IRP plan acceptable to the ratepayers of the Tennessee Valley. The future of TVA will be determined by the Integrated Resource Plan. And as the future of

TVA is determined by the IRP, so is the future of all the people and businesses in the Tennessee Valley who depend on TVA to provide low cost and dependable energy.

I want to thank our distinguished witnesses for coming to Washington today, and I look forward to their testimony. I am also pleased that we have other Members of Congress here that are on and off the committee but interested in the future of TVA, and that is Congressman Cramer and Congressman Gordon, and I see several more Congressmen down there from Kentucky as well as Tennessee. Thank you, Mr. Chairman.

Mr. BORSKI. The Chair thanks the gentleman.

The Chair would now like to recognize the distinguished gentleman from Tennessee, Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman, for having these constructive meetings as well my thanks for allowing me to participate in these meetings.

Rather than repeat many of the good statements of my friend and neighbor, Bob Clement, I am going to submit my statement for the record. I am going to have to leave briefly to go to a Rules Committee meeting but I hope to be back soon. So I am just going to offer my welcome to our first panel consisting of members of the TVA board, including my constituent and former commissioner from Sideview, as well as the other Tennesseans and concerned citizens that have come here to listen and participate in this very important hearing. I think it is good that we're having this. I think that we can have a constructive review and hopefully will allow TVA to continue with its important role. Again, my thanks for letting me participate.

[Mr. Gordon's prepared statement follows:]

BART GORDON
5TH DISTRICT, TENNESSEE
RULES COMMITTEE
BUDGET COMMITTEE
DEPUTY MAJORITY WHIP AT LARGE



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Congress of the United States
House of Representatives

STATEMENT OF REPRESENTATIVE BART GORDON
TO THE INVESTIGATIONS AND OVERSIGHT
SUBCOMMITTEE OF THE
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

MARCH 9, 1994

Mr. Chairman, I would like to take this opportunity to offer a few words concerning the operation of the Tennessee Valley Authority (TVA).

There are several issues of concern before us today that affect the people of the Tennessee Valley. Because the TVA Board has two new members, there is an opportunity for TVA's leadership to forge a new path in the Valley. The Board has shown its commitment to establishing new goals for TVA, and I am hopeful they will continue their work to focus and redefine the mission of TVA.

Currently, TVA holds a debt of \$25.3 billion and an additional \$4.5 billion of defeased debt. The TVA debt ceiling now stands at \$30 billion, and TVA is sure to ask Congress to raise this ceiling in the near future.

As TVA rapidly approaches this debt limit, I feel it is important to keep in mind that all reaches of the federal government must keep an eye toward fiscal restraint and cost-efficiency. Members of Congress would be remiss not to encourage TVA to examine the full ramifications of raising the debt ceiling.

Because TVA's power program is independently financed, the future of spending is in the hands of the Board of Directors. I hope to see a commitment from the Board to hold spending at reasonable levels. Furthermore, TVA must carefully weigh the benefits of furthering the nuclear power program.

As has been pointed out in these hearings very clearly, TVA's nuclear construction should meet a two-pronged test before continuing. First, the nuclear plants must be reliable sources of energy. And second, there must be sufficient demand for the energy produced by the nuclear plants by consumers in the Valley.

Although TVA considers its nuclear facilities to be assets, they can be liabilities if they do not operate effectively and

produce sufficient revenue to justify their operation.

As the Tennessee Valley Authority Act of 1933 pointed out, the principle mission of TVA is to improve the quality of life for the people of the Tennessee Valley. A crucial part of meeting this goal is maintaining competitive electrical rates for both residential and industrial customers.

Fortunately, Chairman Crowell and the TVA board have recognized the value of competitive rates and pledged to keep rates stable until 1997. I am hopeful that this commitment will extend well into the twenty-first century.

TVA's increasing debt makes it more difficult to meet the goal of keeping rates stable. The danger here lies in the threat of industrial customers choosing to leave TVA's service, leaving remaining consumers with the bill. While industrial customers need competitive rates to make it profitable to stay in the Tennessee Valley, residential customers should not bear the burden of supporting their industrial neighbors.

The future of TVA is being formulated as we speak through the Integrated Resource Plan (IRP) process. I look forward to having input from a variety of parties in the final IRP, and I hope to see a commitment from TVA for the next quarter-century to maintain competitive rates, to insure efficient spending as well as to increase conservation efforts.

At this crossroads, the TVA Board is faced with a golden opportunity. The Board has established a number of new goals and has been working hard to meet them. I want to encourage TVA to keep working toward these goals and to renew its commitment to improving the quality of life and insuring a bright future for the people of the Tennessee Valley.

Mr. BORSKI. The Chair thanks the gentleman.

The gentleman from Alabama, Mr. Cramer.

Mr. CRAMER. Thank you, Mr. Chairman. I will try to be brief, and that may be a scary opening there. [Laughter.]

I have looked forward to this hearing for so long that it is kind of hard to channel a few opening remarks and then get ready to ask questions as well. But to begin with, I want to say to TVA that my district there in north Alabama does appreciate you. We are confused and confounded by you from time to time. This may be an interesting time for our new board members to come into this oversight hearing. This is the first that we've had since I've been a Member of Congress or a member of this committee. So I think this is an outstanding opportunity for us to talk on the record about issues that we need to talk about.

Mr. Chairman, I want to thank you and Bob Clement, my colleague from Tennessee, for the hearings as well as for being available to me as I have sort of vented some of my frustrations from time to time about TVA. I want to make a few points here.

TVA is an entity of consequence in my district. A lot of my constituents are concerned and have raised concerns about your organization and your management. That relates to our feelings about your ability to manage the significant work that you do; the debt load, or your commitment to nuclear power, or just where are your decisions coming from and why are you making those decisions.

Before I launch too much more into this, I want to thank Chairman Crowell. You have come to my office recently and you have allowed me to vent with you my frustrations. Johnny Hayes, you have as well. You have said to me that this relationship that I've been very frustrated with will get better, and I am counting on that and I want to work in a positive way toward that.

One of the first things that I did when I was elected to Congress with TVA was to journey to Knoxville to spend some time with you. The best I can say is that my relationship with you, as it had been peaked at that time, went straight down hill from then on. I am talking about things like getting letters answered or understanding with your resource commitments in my communities exactly what you were doing and why and when. I went through a series of awkward meetings with you and with your personnel in my district thinking that we were going to work toward one course of action only to start all over again. Again, I see this pattern infecting TVA and I think you need to be aware that even your own employees in my district are affected, their morale is affected by that kind of hit and run strategy that they see.

I am concerned about the level of your debt. Now you are just under the congressional authorized limit of the debt. I want to know what decisions you are putting on the table that would reassure us that you have got a handle on that and that you are, in fact, making the tough decisions that we want to see you make.

I know that this hearing needs to be as focused as it can be, particularly on the management of the debt and your commitment to the nuclear power program. But I also am interested to know—we fight the battles for you in the Congress with regard to your funding and you have us as advocates, or at least some of us as advo-

cates, for you in that respect—what you are doing with your resource monies, particularly in north Alabama.

My predecessor had a horrible relationship with you and I have purposely wanted that not to affect my attitude toward you. But it is hard not to fall back into some of his patterns of complaint against you. We tend to get a little paranoid there that maybe Tennessee has more of your focus than north Alabama, and that view may be shared by other States that are in the TVA region as well.

Of course, the bottom line that you are to be congratulated for is the rates there in the district. I inventoried my utilities and my local elected officials that have sent letters of concern to me from time to time and they have said positive things about TVA and what you've meant to our area, particularly that the rates have been stable over the last few years. But again, as my colleague, Mr. Clement, has pointed out, we want to see how those compare with other utilities and we want to break those down. We want to see how you plan to encourage economic development. Where are you going to sell power? Are you focusing just within the region or do you have plans to get outside the region? So these are among the many questions that I am concerned with and I want to approach this in as brutally a positive way as I can.

Again, Mr. Chairman, Mr. Clement, thank you for giving me this opportunity.

Mr. BORSKI. The Chair thanks the gentleman.

The Chair would now like to recognize the distinguished ranking member of this subcommittee, the gentleman from Oklahoma, Mr. Inhofe.

Mr. INHOFE. Thank you, Mr. Chairman. Unlike the gentleman from Alabama, I won't try to be brief; I will be brief.

I think, Mr. Chairman, that you and I are the only two on this panel that are not in the TVA service area, so that is a justification for brevity. However, when we are looking at a \$25 billion debt, that is something that has to have the concern of those of us in Congress even if we are not in the immediate area. So I will look forward to trying to become more familiar with this to see how we can be of assistance to this program.

Mr. BORSKI. The Chair thanks the gentleman.

The gentleman from Kentucky, Mr. Barlow, desires recognition.

Mr. BARLOW. Thank you very much, Mr. Chairman. I would just briefly like to touch on a couple of points.

I would like to compliment you all for the wonderful work you did in the past few months as the storms came through our region and we were faced with power shortages, power outages. You did wonderful work. I know you've tried to keep excess capacity at a minimum because it weighs on the rate base, and you all did wonderful work. As a freshman member who is still learning the ropes and was in contact with you at that time, thank you for your time that you spent with me.

I would also like to compliment you on the cost-cutting that I know is going ahead. It has been going on for some time now within the TVA hierarchy. I urge you to keep it up. It will help us bring industry into the region and keep us moving ahead economically as we can keep our electric rates down.

Another compliment to you on your new policy, as I understand it, on contracting to subcontractors and contractors in the Valley. I hope you will put that out throughout the region and help our small businesses and minority contractors.

Finally, touching on the need for research. TVA has always been one of the most important pioneers in energy research since its inception. The reserves of coal, not just in the United States but in the world, are going to be drawn on for many decades to come. Hopefully, TVA can help not just our Nation, but help the world move ahead with clean coal burning technology and put it into a regimented, structural, hard-driving approach over time so that we can look forward to breakthroughs in every area of emission and see electric power continue to go up in usage around the world but the emissions actually coming down in every category. I know in my district the Shawnee facility of TVA has been in the forefront with commercially proving out some of the clean coal burning technology. I hope that you all can give us a report from time to time on the breakthroughs and the accomplishments that are being made there.

Also, I'm interested in the Shell Oil technology that you all have investigated with the Department of Energy for some type of a commercial plant. The Shell Oil coal burning technology developed down in Texas over the last few years is incorporated, as I understand it, in a commercial plant in the Netherlands now, 250 megawatts I believe. I would like to see what the results are in terms of emissions coming out of that commercial scale facility in the Netherlands. Perhaps we might look forward to you all having one of those facilities come on line here in the United States for the sake of our coal mining industry and electric utility industry as a demonstration of what we can be doing in the next rounds of clean coal burning technology.

I look forward to you all staying in close touch with us on clean coal burning because not just in the United States, but around the world it is going to be the source of power for many, many decades to come. The cleaner we can make it, the longer we are going to be able to utilize it. Thank you.

Mr. BORSKI. The Chair thanks the gentleman.

The Chair would now like to recognize the distinguished gentleman from Tennessee, Mr. Cooper.

Mr. COOPER. Thank you, Mr. Chairman. I appreciate this committee holding this hearing and I would especially like to thank my friend and colleague, Bob Clement, the chairman of the TVA caucus, for having this hearing. I look out in the committee room and I see many of the leading movers and shakers of the entire seven State Tennessee Valley area. I appreciate your being here today for this important hearing.

I feel a particular closeness to former Commissioner Johnny Hayes and Craven Crowell who are now leading the TVA board and I think quite well. These are tough jobs that you have to do, perhaps the toughest in the whole Valley. But it is certainly the most important Federal presence in the Valley, and so I am deeply grateful for your service in these important roles. I am confident that whatever problems may be there that we can work through those problems to build a stronger Valley, even better than it is

today for industrial recruitment. The economy is looking up and the TVA presence with rate stabilization over these last several years has been a very positive contributor to that trend. I thank you very much.

Mr. BORSKI. Does the gentleman from Tennessee, Mr. Tanner, desire recognition?

Mr. TANNER. Thank you, Mr. Chairman. I just wanted to come by and welcome the members of the TVA board, two of whom I have known for a long time. We're glad to have you in Washington. Whether the board is glad to be here or not is an open question, Mr. Chairman. [Laughter.]

Mr. TANNER. But we're glad that you all are here.

Mr. Barlow from Kentucky expressed in essence my concerns and my interest in the clean coal burning technology. We've talked about what we can do in the Valley in terms of integrated energy resources and commitments and requirements for the future. I want to commend all of you and your staff. TVA continues to be, in my judgment, a force for good in our country. Your commitment and your dedication to the public service in that regard is appreciated. Thank you.

Mr. BORSKI. The Chair thanks the gentleman.

Before we proceed, I would like to insert into the record at this point a statement received from Representative Lucien E. Blackwell of Pennsylvania.

[Mr. Blackwell's prepared statement follows:]

STATEMENT OF CONGRESSMAN LUCIEN E. BLACKWELL

Mr. Chairman, I am extremely pleased that you have brought this pressing issue before the Subcommittee.

Created by an act of Congress on May 18, 1933, the Tennessee Valley Authority has played a crucial role in the economic development of the Southern United States following the massive devastation which was wrought by the Great Depression.

This Government owned corporation conducts invaluable resource development programs for the advancement and growth of the Tennessee Valley region, which is of vital fiscal interest to the entire Nation.

By controlling floods, developing navigation, producing electric power, developing fertilizers, improving recreational opportunities, and developing forestry and wildlife in this ecologically rich region, the TVA has been an essential presence in this region for the last 61 years.

We are here today, Mr. Chairman to ensure that the TVA can continue to serve this region for another 60 years, thereby providing the vital services which the entire Nation has come to depend upon.

For this reason, I am pleased that we have decided to examine the TVA's involvement in nuclear energy, and the massive debt which has stemmed from this unstable relationship.

When used and managed properly, nuclear power has the potential to serve as a clean and efficient source of energy, which in many parts of the United States, has become a mainstay in our Nation's energy strategy.

It is clear, however, that for a variety of reasons, the TVA's involvement with nuclear power has not been a successful one.

Operating incidents, shutdowns, and construction delays have apparently taken their toll on the TVA, and have created a disastrous debt which has escalated to heights previously unseen.

That is why we need to ask the vital questions, and examine the recent actions which have been taken to ease this enormous debt, to get the TVA back on their feet.

Too many towns throughout this country rely on the TVA for their economic livelihood for us not to take immediate action.

If our Nation is to remain strong, and stick to the comprehensive energy strategy which we helped to formulate in this very subcommittee last Congress, we must start by examining the TVA.

I am eager to hear from our excellent witnesses which the Chairman has assembled, and I commend him once again, on bringing this vital issue to the forefront of the Subcommittee agenda.

Thank you, Mr. Chairman.

Mr. BORSKI. We would like to now welcome the Honorable Craven Crowell, chairman of the Tennessee Valley Authority. Chairman Crowell is accompanied by Mr. Johnny H. Hayes and Mr. William H. Kennoy, members of the board, Tennessee Valley Authority.

Gentlemen, may I ask you to stand please and raise your right hands.

[Witnesses sworn.]

First, I want to thank all of our witnesses for appearing before the subcommittee today. Since we have several witnesses to hear from this morning, I would ask each of you to limit your oral statement to five minutes. Of course, your entire statement will become part of the hearing record.

With that, Chairman Crowell, you may proceed.

TESTIMONY OF THE HON. CRAVEN CROWELL, CHAIRMAN, TENNESSEE VALLEY AUTHORITY ACCOMPANIED BY HON. JOHNNY HAYES, MEMBER OF THE BOARD, TENNESSEE VALLEY AUTHORITY, AND HON. WILLIAM H. KENNOY, MEMBER OF THE BOARD, TENNESSEE VALLEY AUTHORITY

Mr. CROWELL. Thank you very much, Mr. Chairman. We have been looking forward to the opportunity to appear before you. I have submitted copies of my prepared testimony for the record and I will do my best to summarize as much as I can consistent with the need to try to answer the questions that you have asked me to answer.

Eight months ago, my board colleague, Johnny Hayes, and I were sworn in as new members of the TVA board. We joined Bill Kennoy, who has served for three years, to form a new board for TVA.

More than eight million people depend on the electric power TVA produces to keep their homes comfortable and safe and their businesses operating. Millions of people use the 650-mile Tennessee River and its tributaries for recreation and commerce. When everything is right, people can take their electric power and our river system for granted. When our systems are tested, as they have been by recent storms, we are reminded just how important it is that we put every ounce of energy and imagination into keeping the power flowing and the rivers regulated.

Congressman Clement, as a former TVA board member, understands how this commitment affects the lives of people throughout the Tennessee Valley region. After I was sworn in as chairman in July, the board set out on Phase One of our long-term plans for TVA, in the form of a five-point leadership plan for our first six months in office.

In that initial phase, Phase One, we wanted to reorient ourselves to the problems and concerns of TVA customers and employees. We wanted to set strategic goals, then we wanted to monitor and report on those goals. We wanted to hire a chief operating officer, and restructure TVA for the future. Johnny Hayes and I undertook a two month orientation program to see and hear first-hand what

issues were important to our customers, our employees, and community leaders throughout our region.

We heard loud and clear that, number one, our rates are important and should be kept stable; second, that our environment was important and should be protected; and third, that TVA was putting contractors first and employees second, therefore adversely affecting their productivity. We heard these messages over and over again.

In September, the TVA board and top executives developed three strategic goals—to maintain competitive electric rates, to make TVA an environmental leader, and to put our people first. More specifically, we committed to not raising rates for four more years. That would mean going a full decade without increasing our overall revenues through a general rate hike.

Having stable, competitive rates for electricity is the single most important thing we can do for everyone in the Tennessee Valley. From people on fixed incomes to small business owners to those running hospitals and schools, our rates make a big difference.

Stable rates are just as important for industrial growth and job creation. In fact, since TVA froze its rates in July of 1988, more than 4,500 industries have announced plans to begin or expand operations in the Tennessee Valley. That represents an investment of \$19.2 billion and the creation of more than 200,000 jobs. Now, of course, TVA can't take credit for every dollar invested or job created, obviously. But abundant low-cost energy is an essential ingredient for strong, sustained economic growth. To keep our rates competitive, we have focused on the needs of our customers.

Our second strategic goal is to make TVA an environmental leader. We have recently refocused and renamed our environmental research center at our facilities in Muscle Shoals. We are in the process of developing a comprehensive environmental management plan for our region's resources.

Our third strategic goal is to put our people first. We know that to operate our power system competitively and to obtain our goal of environmental leadership we must have our people with us all the way.

After we established our strategic goals, we appointed a chief operating officer to take care of our daily operations and make sure we meet our strategic goals. We also named a chief administrative officer to make sure our corporate functions are organized and carried out effectively. And we also put in place a chief nuclear officer so that we can focus more attention on our nuclear operations. And we have also recently hired a senior advisor to the board to work directly with the three of us. We are confident in the organization we have in place and the direction we have set for TVA.

Mr. Chairman, TVA is operating well and it is meeting challenges both natural and man-made. At TVA, we are looking toward the future by preparing a long-term energy strategy called the Integrated Resource Plan or IRP. The IRP represents Phase Two of the new board's direction for meeting the challenges of the 21st Century. This process was started in January and it will take between 18 months and 2 years to complete.

When we are done, the IRP plan will provide a 25-year energy strategy for TVA. It will also be this board's blueprint for TVA's

power future. It will focus on our power facilities, our conservation and demand-side management programs, new technologies for meeting future power needs, and how we can meet those needs more competitively. The board will have weekly briefings on all aspects of the IRP planning from short-term power considerations to load forecasting into the next century. All major stakeholders will have an opportunity to become involved in the IRP process. We will be intimately involved with our distributors and direct-serve customers in this process. We will hold public meetings and we will assemble an IRP review group.

The challenge facing the TVA board will be to take all the information gathered and decide the most efficient and appropriate balance between the energy that will be needed and how TVA will most efficiently supply it. This is an unprecedented degree of public input in the decisions which will guide TVA's future. I personally welcome this new scrutiny and I can assure you this board will go the extra mile to ensure the success of the IRP process.

This brings me to the decisions we will have to make regarding TVA's nuclear units. I might say, Mr. Chairman, we have provided a detailed history of this for the record. Today, I will talk just briefly, if I might, about the status of the nuclear program as it existed eight months ago when I returned to TVA.

TVA had five licensed nuclear units; only one of those, Browns Ferry unit 2, was on-line and generating power. Since then we have returned one unit at Sequoyah to service and we expect to restart the other one soon. In addition to the units already licensed, two units at Watt's Bar nuclear station were under construction and two units were planned at Bellefonte.

One of the most significant decisions this board has made is to take a hard look at the four nuclear units that are the furthest away from completion. Ultimately, this board must decide what to do about Watt's Bar 2, Browns Ferry 1, and the two units at Bellefonte. As we make those decisions, we will ask the hard questions: Are those units needed? Are they worth the cost of construction or refurbishing? Would it be better to convert these units to another fuel source? Would these units serve to lower TVA's rates and make TVA more competitive?

We understand that the level of TVA's investment in our power system is important to this committee. A complete account of our debt and debt structure has been submitted for the record, Mr. Chairman. We intend to control our debt in the future and to make sure there is a good balance between our overall need for capital and the need to keep current rates competitive.

Mr. Chairman, TVA is a financially sound corporation and is consistently rated AAA by financial experts who guide investors across the country. The reason we have been able to refinance a large portion of our debt is that utility investors, the people who evaluate utilities for a living, have great confidence in what we're doing. In two separate bond offerings since last July, TVA has offered a total of \$1.2 billion in 50 year bonds on the public markets. In both of these offerings, our bonds sold quickly and brokers on Wall Street were requesting more. These quick sells show that America's investment community judges TVA's long-term prospects to be excellent.

TVA, like all utilities, is operating in a new world of competition. Low rates and high quality service will be the only way to survive in the future. One of the most effective measures we've undertaken to cut our costs has been to refinance \$18.4 billion of existing debt at lower interest rates. There is one chunk of TVA's debt though that we have been unable to refinance; some \$6 billion in non-callable debt with the Federal Financing Bank. It is not because we haven't tried. We have been discussing this proposal with the Department of Treasury and we believe they have the authority to allow us to refinance this debt but we have not reached a resolution on the issue. If we were able to refinance, we could cut our annual interest payments by anywhere from \$100 to \$140 million a year, depending of course on interest rates at the time of refinancing. Since TVA exists to benefit the people it serves, we would be able to use these funds for needed capital projects or pass them along as savings to our customers.

As he mentioned earlier, Congressman Clement comes from the Valley and he knows the importance of TVA. And as a former TVA board member, he understands how TVA's rates affect those on fixed incomes and those working to keep a small business going. Our commitment to stable rates is essential to our competitiveness, to the competitiveness of our customers, and to the economic well-being of everyone in the Tennessee Valley. Low rates, high quality, strength and flexibility, and the adherence to good planning will be the cornerstones of success in the 21st Century.

My term on the TVA board extends into that century and I am deeply aware of how the decisions we make today will affect people tomorrow. Our responsibility to the future is a stewardship that none of us on this board, Mr. Chairman, takes lightly.

We appreciate the opportunity to address this committee, to inform you of the progress we're making at TVA, and to ask for your help with our efforts to keep TVA as competitive as possible. I thank you very much.

Mr. BORSKI. Thank you very much, Mr. Crowell. It is an excellent statement.

Let me start by asking, has your staff prepared a financial projection of TVA's costs and revenues for the next several years showing what you expect demand for power to be, what you expect will be the cost of generating that power, and what revenues you expect to earn from selling that power?

Mr. CROWELL. As I mentioned in my statement, Mr. Chairman, the IRP is being taken very seriously by this board. In fact, when we came on the board, the IRP was in progress internally. I put a hold on that until we had a chance to address it ourselves because it is going to be our IRP, this board's IRP, not a previous board's IRP.

So in the process of doing that study, Mr. Chairman, it is our expectation and plan to look at all the issues that affect our power system into the future, including those that you mentioned.

Mr. BORSKI. Are there any financial projections that you have for us thus far?

Mr. CROWELL. Financial projections?

Mr. BORSKI. Yes.

Mr. CROWELL. We have financial projections until 1997. That is what we based our commitment to no rate increase on. I would be happy to supply some details for the record, if that is of interest.

Mr. BORSKI. Let me ask, did you conduct a sensitivity analysis on the affects of variation in capacity factor for your nuclear power plants and demand growth for power in those assumptions?

Mr. CROWELL. Let me just briefly talk for a minute about capacity factors at our nuclear plants. Our Browns Ferry plant historically, including the times it has been operating and not operating, has run at a capacity factor between 50 and 60 percent. The Sequoyah plant has historically averaged between 60 and 70 percent. Of course, Browns Ferry unit 2 is doing much better today because it is on a record run of 280-something days and so the capacity factor there is nearly 100 percent, and has been for about a year or so. So our projections for the future would be based on those averages of what we could expect to generate from our nuclear facilities.

Mr. BORSKI. Mr. Crowell, do you plan to provide financial resources to the review group in your Integrated Resource Plan process to allow them to hire outside experts to critically examine the assumptions and analysis provided by TVA? If not, how do you expect the IRP process to be successful?

Mr. CROWELL. It would be my expectation, Mr. Chairman, that we would provide opportunities to hire consultants for the review group. I might also say that we would expect as a board to perhaps hire our own consultants to work directly with the board on the IRP process. So we would anticipate making funds available to hire consultants. We would do this in a partnership with the review group.

Mr. BORSKI. And you will provide them with the resources to critically analyze what decisions you are making?

Mr. CROWELL. Yes. We are going to set up a review group and we will provide them resources to hire a consultant to work with the review group. Yes, we'll do that.

Mr. BORSKI. Mr. Crowell, can you tell me why is the IRP process projected to take so long? Other utilities, such as Public Service Company of Colorado, have completed IRPs in as little as nine months. Why should it take the TVA's process two years?

Mr. CROWELL. Obviously, if we can get it concluded sooner, that would be preferable. If you do the IRP and do it right and do it as open as we're talking about doing and give the public opportunity to have an input, it is going to take some time. It is not something that we can do quickly if we expect our stakeholders and the people who buy our power to be involved in what we're doing. So the process has to have some length in order to encourage participation. We have just mentioned 18 months to 2 years as a time-frame.

But, I might just note here, I think when you make decisions, particularly if you are going make decisions about the future of nuclear units and what they do to you financially, you need some sort of process. In the past, I think sometimes previous boards have made those decisions too quickly and, therefore, people have not fully appreciated the reasons for the decisions being made. But if

we are going to do a true IRP process, we have to have some built-in length to allow people the opportunity to have input.

Mr. BORSKI. Thank you, sir.

I will yield the floor now. Let me suggest to the members, because we have so many people here with such great interest, that we try to limit our members to 10 minutes for this round and we will have succeeding rounds for as long as that may take.

I now recognize the gentleman from Tennessee, Mr. Duncan.

Mr. DUNCAN. Thank you, Mr. Chairman. Gentlemen, I would like to once again say welcome to you. Mr. Crowell and Mr. Hayes, I think from the impression that I have that both of you are getting off to a very good start in your new work as board members and I commend you. And certainly it is a pleasure to still have Mr. Kennoy on the board because I think he has been a very valuable asset to the TVA.

Mr. KENNOY. Thank you very much.

Mr. DUNCAN. During the five years that I've been in the Congress, slightly over five years—and I told someone yesterday that I get about a thousand letters or post cards a week and about 2,000 or 2,500 phone calls in a typical slow week—and in all that time I've heard about everything you can imagine, but I have heard very little from my constituents about TVA. I think that is a compliment because if they were upset with TVA, I would be hearing from them. I think in large part that has to do with the fact that the rates have remained stable over the last few years.

I know you have stated it as your goal or your commitment to keep those rates stable at least through 1997. Do you think that you are going to be able to do that and still do something about the indebtedness that has been such a concern here today?

Mr. CROWELL. Yes, but I don't want to leave the impression, Mr. Duncan, that it is going to be easy to do that. It is going to be difficult, it is going to require some more belt tightening by TVA. We are going to have to do something about our O&M costs and bring those down and get our productivity up. We set 1997 as a goal. It is not an easy one, otherwise it would not be as challenging as it ought to be. So we are confident that we can do it but it is going to be a stretch for us and we're going to have to do a few things to save some money along the way.

Mr. DUNCAN. Mr. Kennoy, let me ask you, is there something that we can do about this debt or, like the national debt, is it out of control and going much higher regardless of what we do almost?

Mr. KENNOY. I guess I am fortunate to be the transition between a previous board and this board and have been able to look at it in both ways. The debt is manageable but we need help. As Chairman Crowell mentioned earlier, we need help on that \$6 billion refinancing with Federal Financing Bank. That would save us \$100 to \$140 million per year if we could have that help. We are working on that and that is something that TVA needs and something TVA needs your help on. So that is one thing right off that would be helpful to us, Mr. Duncan.

Mr. CROWELL. If I might say something, Congressman.

Mr. DUNCAN. Yes, sir.

Mr. CROWELL. TVA operates on a balanced budget, that any money we borrow goes to capital expenditures and we have to gen-

erate revenue to cover all our expenses, including the interest costs. The debt is something that we need to do something to reduce that in the future, but I don't think there are any opportunities to do that until we come to some sort of conclusion on the construction program. If we are going to continue to build like we're building, obviously there's not many opportunities there to reduce the debt. So that's why I think this IRP process is so important, particularly as it looks at our construction program. That is going to be a really, really big issue in the IRP process.

Mr. DUNCAN. The IRP has been mentioned many times here so far. I understand that the Watts Bar unit 1 was not included in the IRP.

Mr. CROWELL. Right. Right.

Mr. DUNCAN. Why is that?

Mr. CROWELL. Well, when I came onto the board as chairman, Watts Bar unit 1 was essentially 99 percent complete. It was really a 1 percent decision for us. And the "to go" costs on Watts Bar 1 are between \$500 and \$550 million. And if you deferred it, the interest charges alone over a two year period would be more than that. If you looked at it from whether you went ahead and finished it with the expectation that it will become an operating asset prior to the completion of the IRP, it just didn't make sense in my mind to put it out there beyond the completion of the IRP if it is going to cost us more and if it is going to be an operating asset prior to that.

But one thing that is significant here that this board has done, as I mentioned in my prepared remarks, is that this board has put three construction projects on the table to look at what do we do with those in the future. That was a departure from the policy that was at TVA when we got there. The policy was to go ahead and build those. What we're saying is we're going to take a new look at them. So that is a fairly significant move on our part to make that decision. That decision has been made that a new look is going to be taken at those three units.

Mr. DUNCAN. Talking about Watts Bar, I've toured that facility and I remember when I did tour Watts Bar that some of the TVA people told me that in Japan they get a nuclear power plant on line in an average of four years, in France in six years, and so forth. And yet, we have been trying for, what, 22 years or something like that to get Watts Bar going. Most people I think all over the country, but certainly in East Tennessee, think that is just ridiculous that we've gone that long without getting anything out of it.

Do you think it is realistic to hope or believe that we're going to get Watts Bar on line very soon? I notice that there is a witness later today from the NRC who says that they believe that we really won't get Watts Bar on line, that the fuel won't be loaded by the fall of this year, and that they believe that some slippage is likely. Do you think that some slippage is likely?

Mr. CROWELL. I think that if there is slippage on meeting the schedule, I think it will not be great and certainly would not affect the major premise that it will be an operating asset prior to the completion of the IRP.

Of course, this board is very concerned about the safety questions involved at Watts Bar. As you mentioned, it has been under con-

struction some 20 years; I think we started in 1972. It has had a litany of problems along the way but I think most of those have been solved and we're down now, as I said, to sort of a 1 percent decision to go on Watts Bar. We would of course not go forward if we thought there were any safety concerns. That goes without saying that that is an issue we would take very seriously and we would not proceed if there was any doubt in my mind about the safety of Watts Bar 1. But if there is any slippage at all, it should not affect the major premise of having it as an operating asset prior to completion of the IRP.

Now I might say something about the generation at Watts Bar, and this was factored into the decision, too. If you look at Watts Bar 1 and you use our capacity factor of, say, 50 percent, which historically we have not been any lower than that on any of our nuclear plants as an average, and use the 50 percent capacity factor and look at what it would generate on the average selling price of our power, which is about 4.2 cents per kilowatt hour, Watts Bar 1 over 40 years would generate something like \$8.6 billion in revenue even at a 50 percent capacity and not factoring in any rate increases, just having it at the same rates as today. So if you look out into the life cycle of that plant, you are talking quite frankly about some figure that is well over \$10 billion in a 40 year period of generating revenue. So we thought that we needed to get some revenue out of it as opposed to delaying it any further or deferring it.

Mr. DUNCAN. Some people I think feel that TVA has no competition from anybody. But does TVA face some competitive pressures? What I am really getting at is I was given some information that Bristol, Virginia and Memphis have threatened in recent times to pull out of the TVA system if the rates went up substantially. Is that correct, and what would be the effect on TVA if a major city like Memphis pulled out of the TVA system? Is there tough competition out there for TVA today?

Mr. CROWELL. Let me address that for just a moment because that is a very serious matter that I am looking at now and I think comes under the jurisdiction of this committee. In 1959, when TVA got permission to be a self-financing power program, there was a fence put around our service area so that we can service customers inside that fence but we can't go get customers outside that fence. Now Bristol, Virginia was made a proposal by APCO to take them away from our system and it was through some very lengthy, protracted negotiations that we were able to keep Bristol, Virginia as a customer.

I recently was in Alabama meeting with a group of Alabama distributors, and I think all of the distributors from North Alabama were there, and they were telling me that I need to pay attention to what Alabama Power is doing. They were telling me that they believe Alabama Power has a strategy to take customers away from TVA. They have increased their presence in our service area substantially. The problem that I have with that is they can come in and try to take our customers, Congressman, but we can't go compete with them. And if you look at our costs for residential electricity, if you look at the 23 utilities in the Southeast, our residential rates are the fourth lowest. And if you look at some of our in-

dustrial rates, particularly our ESP rates, with 25 or so utilities around the Southeast, you will find that we're down at like the second lowest on some of our special rates. So we believe we are in a position in which we can compete with surrounding utilities, particularly if we've kept rates stable for six years and we can keep them stable for four more years; for a full decade.

I guess it is sort of like the people in North Alabama were telling me, Mr. Chairman, you need to pay attention to this because this is an issue that may be down the road. The only thing I can say to this committee today is that it is not an immediate problem for us because we don't have any customers I am aware of who are going to be leaving in the next few months or next couple of years to go with some other power company. The only thing I would say is I may be back to see you at some point before my term is over to permit me to put some fairness into this whole system. Private power companies can't have it both ways; I don't believe that is fair.

Mr. DUNCAN. Let me just hit on a couple of other things quickly before my time runs out. One is Congressman Barlow compliment you on the new policy to try to issue contracts where possible to Valley contractors. I think that's good. Has that now been adopted and do you think that is something realistic? And then going from that, I am all for contracting out when something can be done more cheaply and more efficiently. On the other hand, I am opposed to private contractors making rip-off fees from the taxpayers. Do you have plans to give the TVA employees where possible an opportunity to prove or show that they can do certain things more cheaply or more efficiently than sometimes the private contractors can?

Mr. CROWELL. This board adopted two policies recently. One was the contracting out policy you just mentioned. And at the center and the heart of that policy is that before a manager can contract out a certain part of TVA they have got to involve the employees, the union representatives, and they have got to look at it from everybody having input into it. So there has been a big change in the way we are going to look at contracting out. So to answer your question, yes, it does permit employees to have input into it before the decision is made. That policy was adopted by us just about a month ago.

A second policy we developed, which you mentioned, was a policy that says we want to do business in the Valley first whenever we can do it and stay competitive. We can't subsidize companies, obviously, but what we want to try to do is encourage people to move into the Valley to get our business and to try to use that as an economic development tool.

So those two policies have been adopted by this board.

Mr. DUNCAN. One last thing, I don't want to take up too much time here. I do know from talking to other people around the country and even other Members of Congress from around the country that there is a big misunderstanding about TVA. I think there are some people in other parts of the country who believe that the taxpayers are subsidizing to a huge extent the operation of TVA. TVA has revenues I understand now of \$5.3 billion, roughly.

Mr. CROWELL. Right.

Mr. DUNCAN. And the Federal appropriation for TVA this year is \$140 million.

Mr. CROWELL. Right. That is correct.

Mr. DUNCAN. Which would be roughly about 2 percent or something like that of the total operation. Going from that, of that \$5.3 billion, we're talking about this debt, and certainly it is a terrible debt and you wish it wasn't there and I wish it wasn't there and we need to bring it down, but you paid \$1.7 billion in interest I understand last year. Is that roughly correct?

Mr. CROWELL. Yes. Right.

Mr. DUNCAN. You are meeting your interest payments and yet you still, according to the financial statement we have, had a net profit of \$311 million. That is after you paid the interest, right?

Mr. CROWELL. Right. We prefer to call it retained earnings, Congressman. [Laughter.]

Mr. DUNCAN. All right. Well, thank you very much. I will have some more questions later.

Mr. BORSKI. The Chair thanks the gentleman.

The distinguished chair of the full committee, Mr. Mineta.

The CHAIR. Thank you very much, Mr. Chairman. Let me again welcome the chairman and the members of the board to the Public Works and Transportation Committee.

Mr. Chairman, you had indicated that you felt that Wall Street was really backing what all of you were doing because of the low interest rates. To what would you attribute those low interest rates that you seem to be getting for your bonds?

Mr. CROWELL. Let me say this, I understand completely, Mr. Chairman, that we are a Government agency so, therefore, it does have impact on how people view us and how they buy our bonds. The point I was trying to make in my statement is that the 50 year bonds, which are a little unusual for us, for them to have sold as fast as they did I was simply underscoring the fact that I thought that showed that there was confidence in the long-term prospects for TVA. But I think it obviously helps us that we're a Government agency to market bonds.

The CHAIR. Does that come because of the fact that they have confidence in TVA or do they look at TVA as having the full faith and credit backing of the United States Government?

Mr. CROWELL. I think that having the full faith and credit of the U.S. Government obviously helps us immensely, there is no question about that. I think it was though noteworthy that 50 year bonds sold as fast as they did for TVA because at the same time we made that offer we were offering 30 year bonds.

The CHAIR. Do you have, in fact, the full faith and credit of the Federal Government in TVA?

Mr. CROWELL. No, we are self-financing as part of the 1959 self-financing amendments.

The CHAIR. So I guess Wall Street sort of looks at it on the basis of, well, they are not going to let TVA go under; whereas in real fact, you don't have the full faith and credit.

Mr. CROWELL. That's correct, we don't have the full faith and credit of the Federal Government. But the point I think you're making, which is excellent, is when you start looking at selling

bonds, the fact that we're a Government agency obviously is a big help.

The CHAIR. Let me ask about the Integrated Resource Plan, IRP, or resource planning as a process. What do you look at as the purpose of adopting IRP as a way of doing business? Do you look at it in terms of stability of rates, in terms of forecasting growth potential, looking at alternative energy efficiency? What does the board look at IRP to do?

Mr. CROWELL. All of the above, Mr. Chairman. We look at it as a totally integrated process. As I have said, it is unprecedented the amount of effort we are going to go to to get input on this process. We think it will answer a lot of questions for us. I think it will also, obviously, present a lot of decisions for this board to make as we get into it and as we conclude it.

The CHAIR. And the IRP is being done by whom?

Mr. CROWELL. The IRP is being done by us.

The CHAIR. Is it being done in-house?

Mr. CROWELL. It is being done in-house with consultants who are helping us from outside. And of course we will have a review group, as I mentioned, which are outside people. So when you say "being done", it is being managed inside because this board has to make a decision at some point on what we do at the end of the process and so it has to be managed by TVA. But I think managed maybe is the wrong word. We view it as a partnership with our customers and with other people who are going to be participating in the process.

The CHAIR. And you are comfortable with the kind of input that you're getting from customers and others into the IRP?

Mr. CROWELL. We just started the process, Mr. Chairman, and I am not comfortable right now with much of anything about the process other than the fact that I'm committed to doing it right and being sure that we get the right information. I know it is the decision of the three people you see in front of you; at the end of the process it is our decision to make and we want to be sure we make the right decision and we have the right participation in the process. So we have a long way to go with it; we're just now getting into it.

The CHAIR. And will the IRP be involved in forecasting projections of demand in the future?

Mr. CROWELL. Yes, absolutely. One of the issues I am particularly interested in is DSM because I don't think we're doing nearly enough. In fact, we're doing practically none because we have been going in the direction of building new capacity instead of looking for opportunities to generate the needs of the future in power supply from energy efficiency opportunities. So I am particularly interested in exploring that in great detail and we're just simply not doing enough of it now.

The CHAIR. You are familiar with Doctor Passerini?

Mr. CROWELL. I am not sure I've ever met him, Mr. Chairman, but I do know he is on the witness list today.

The CHAIR. Right. Have you seen any of the reports that he has submitted to the TVA board in the past?

Mr. CROWELL. I believe that he sent a report to me at one point with a cover letter. If my memory is correct, I did see something he may have sent to me.

The CHAIR. One of the things that caught my eye in terms of his statement here is just in looking at the projections in the future in terms of where TVA is going, TVA has always had these kinds of very optimistic projections in terms of demand. And yet, in looking at the figures—and I assume that these are accurate figures—in actuality the figures have been very, very short of where the projected demands are. And that is why I was asking earlier about to what extent are you going to be using outside people to take a look at what you're doing, because we find the problem around here if we rely on FAA they have sort of a NIH mentality—Not Invented Here; if you look at NASA, they have sort of a NIH mentality here.

Sometimes I wonder when I see these kinds of graphs and projections whether or not maybe TVA doesn't have that same problem of Not Invented Here. If it is someone else's work, eh, who cares. But that is why I am wondering to what extent you will be looking at trying to be as inclusive, that whether you like the information or not, you have the ability at least then to analyze and make a judgment on the kind of input you're getting. But to the extent that the bureaucrats within the agency are saying, no, we're not going to be listening to others, or no, that's that bologna report; forget it, to that extent it really does a disservice in terms of something that everyone is saying now is a good process.

IRP is something we ought to be dealing with. It is something that investor-owned utilities are using, other publicly owned utilities are using, and that the board has adopted as a planning tool. You may restrict yourself in terms of input if you become very insular in terms of the information that reaches you.

Mr. CROWELL. You make a good point about Not Invented Here. This IRP, as I mentioned, is going to be the blueprint for my tenure as chairman and I am taking it personally very, very seriously and I want to be sure it is done right.

Let me address for just a moment the capacity margin that you mentioned. You are correct when you say that our history has not been good on that in the past, particularly before 1985. But since 1985, our load forecasting has been much better, in fact it has been within 5 percent plus or minus what actually happened since 1985. So we are doing a better job. In fact, an outside consultant, Barakat & Chamberlin recently submitted a report to us in which they commended our load forecasting methodology and what we're doing.

Now just to give you an example on the margin, on January 18 when we had some cold weather in the Valley, we set a new all-time record for demand of 24,700 megawatts when, in fact, we had 25,500 as our capacity. So in effect, on that one day we only had a 5 percent margin. We would like to have 10 percent.

But you do make a good point about Not Invented Here and we are going to pay particular attention to that because that is a good suggestion.

The CHAIR. Because there are others who are anxious to get at questions, let me thank you again. Thank you very much, Mr. Chairman.

Mr. BORSKI. The Chair thanks the gentleman.

The gentleman from Tennessee, Mr. Clement.

Mr. CLEMENT. Thank you, Mr. Chairman. I will follow up, Chairman Crowell, on some of the questions that our full committee chairman was referring to concerning the Integrated Resource Plan. What is the status in selecting members of the review group today?

Mr. CROWELL. We are still working on that, Congressman, but I can assure you that I personally will be involved in the selection of those people.

Mr. CLEMENT. When do you think that process would be completed?

Mr. CROWELL. Obviously, the sooner the better. I would say it certainly will be days not weeks. We're working on it now.

Mr. CLEMENT. What interested parties are you considering to make up the review group?

Mr. CROWELL. We obviously are considering environmental groups. We will pay particular attention, however, to our customers in this process because they are the ones who buy our power and who are partners with us on the financial stability of TVA for the future. So our customers will be involved—when I say “customers” I mean our direct-serve customers and our distributor customers—in a very special way. But we are still in the process of identifying other groups who should have representation on the review group, but we certainly will try to make it representative of the Tennessee Valley.

Mr. CLEMENT. As you know, when I was on the TVA board the load forecasts were abysmal.

Mr. CROWELL. Yes. You were there before 1985.

Mr. CLEMENT. Yes, 1979 to 1981. It was unbelievable how far off TVA was during that period of time. I realize other utilities around the country as well as in other countries had over projected but not to the degree that TVA had.

Let me ask you also about the IRP. There are no plans for TVA to provide the review group with funds to generate secondary independent data. Why not provide the funding necessary to allow the review group to run an independent analysis outside of TVA? If TVA's data is accurate, then the independent analysis would merely confirm the data. What is your position on this issue?

Mr. CROWELL. Well as I mentioned earlier to the chairman, I have no problem with making money available to hire consultants to help the review group. This is not a problem with me to do that.

Mr. CLEMENT. I know when I was chairman of the Tennessee Public Service Commission and we had the various private and investor-owned utilities come forth asking for a rate adjustment, many times in many of the major rate cases we would have an expert on return on investment.

Mr. CROWELL. Right.

Mr. CLEMENT. Because we don't live in an isolated world, we don't have hundred foot walls within the TVA area, that we are impacted by what happens outside the TVA region when it comes to adjusting rates or projecting for the future.

Mr. CROWELL. Yes, and I think when we get the review group together, if the review group in partnership with us feels like they

need some outside help, I would certainly be all for that. I don't have a problem with doing that. I think that any time we get outside help—as I mentioned to the chairman's question earlier, I would anticipate that this board would in fact hire an outside consultant to assist us directly.

Mr. CLEMENT. So you are saying it is not going to be just internal?

Mr. CROWELL. No. I want it done right. But let me tell you, people ask me sometimes my philosophy about management. My philosophy about management is simply this: Everybody who is involved ought to have a say about it, but only certain people have the vote. And you are looking at the votes at this table, the votes that have to be cast to approve any IRP. But I think it is very, very important and I am very committed to being sure that everybody who is involved has a say about what we do. But I am also very well aware of the responsibility we have of casting that vote.

Mr. CLEMENT. Let me see if I understand what you are saying. Are we saying the TVA board is going to choose these outside consultants, or is the review group going to choose these outside consultants?

Mr. CROWELL. I'm saying two different things. One is the board, the three of us, may in fact—and we haven't decided this yet but it is something under discussion—may in fact decide to hire a consultant to help the three of us with the IRP process. Just as we have a nuclear advisor to the board, it is not a management person but it is somebody who helps us be sure that the right questions get asked and the process is done right. That is one issue.

The second one is if the review group needs funds to hire consultants to assist the review group, I have no problem in assisting that group.

Mr. CLEMENT. There is a real question regarding the competitive character of TVA's assets. The facts are that TVA's five licensed nuclear units just have not been reliable over the last 20 years. In addition, utilities are retiring nuclear units way before their 40 year operating licenses have expired because the economics of running the plants are just not there. Why not evaluate all nine nuclear units in the IRP? It just seems to make good sense for the ratepayers. Do you agree?

Mr. CROWELL. Well, in essence, an IRP process, Congressman, is a process where all of your generating capacity gets reviewed in relation to what you have now and what you think you may have in the future. In fact, there are some high cost fossil units that we're operating that will be reviewed as part of the process too. So, in fact, the process itself does include all nine nuclear units plus everything else. The 11 fossil plants and the 30 hydro facilities that we have get included in there.

The thing that this board has done differently since we've been there was to take three projects under construction and say we're going to take another look at that. Now we could have taken a look at that as a separate issue outside the IRP and say we need to look at these construction projects. But it was my feeling that they ought to be included in the whole process so that you don't do anything that affects a process that you want to be an accurate and a well thought-out and deliberate decision. So they were put in

there. Now of course Browns Ferry unit 1 even when I got there was in lay-up so we didn't change that at all.

Mr. CLEMENT. Are you saying then that Watts Bar 1 is included?

Mr. CROWELL. Everything is included, yes.

Mr. CLEMENT. Everything is?

Mr. CROWELL. Everything is included because that is just the way the process works.

Mr. CLEMENT. Okay. Concerns have been raised that the board does not have enough staff or independence to really question the various heads of the different groups in TVA. For example, the same people making recommendations to the board are also the same people who are involved in the operations of that and who have a vested interest in it. In every other utility in the country, the utility must answer to and seek approval from an independent public service commission. Thus, if a utility wanted to raise rates, it must present the information to the PUC or PSC. I think what you are saying now is that you are going to move forward with that independent analysis when it comes to the IRP. That you are not going to do it internally.

Mr. CROWELL. I'm not sure what you mean by an independent analysis. Hiring consultants to help us is different than letting somebody else do our job for us, which I don't intend to do.

Mr. CLEMENT. Let me give you a hypothetical situation for a moment. If Watts Bar 1 goes commercial, according to TVA the cost of depreciating that plant is \$200 million a year. That is \$200 million that is new expense. On top of that, at the end of 1994, the long-term contract TVA has with the Department of Energy ends, which means TVA will lose \$160 million in revenues. So right there I have \$360 million in either lost revenue or added liability that you must factor. On top of that, you have refinanced all the debt so there is no more savings there. Last year, TVA's net revenues totalled \$311 million. You have \$360 million in lost revenue and added liability and net revenue totals about \$311 million. How are you going to make up the difference?

Mr. CROWELL. I think the figure you used on Watts Bar for depreciation is not accurate. I think it is \$113 million, Congressman, instead of \$200 million. What we plan to do is, as I mentioned to the chairman earlier in questions he was asking about our rates for the future, is that we know that we have to do some things here to keep rates stable until 1997. It is my belief that we can bring Watts Bar on, considering the O&M costs and depreciation which would be about \$180 million total, that we can do that without raising rates, and that is what our plan is.

Mr. CLEMENT. All right. Thank you, Mr. Chairman.

Mr. BORSKI. The Chair thanks the gentleman.

The gentleman from Alabama, a valuable member of the committee, Mr. Cramer.

Mr. CRAMER. Thank you, Mr. Chairman.

Mr. Chairman, I want to pick up on where several of our members have questioned you about your IRP. I think I recall you making the comment earlier that you weren't well into that. Are you comfortable with that process and your hand is around that, as new as you are?

Mr. CROWELL. As I mentioned, the IRP process was in the beginning stages when I came on the board. Since I viewed it as a blueprint for not only my tenure but as a 25 year projection for TVA's power future, I felt it was necessary for us to be intimately and personally involved in it. So we delayed it from last July when I came on the board and we started the process again in January. So we are only into it two months. What I am saying is I don't have enough data yet to tell you whether I am comfortable or not comfortable. I would simply say I am obviously not comfortable at this point about making any big decisions.

Mr. CRAMER. There are a lot of decisions particularly about the review group and your consultants and all that remain to be determined.

Mr. CROWELL. Right. Right. We've got to do all of that; yes.

Mr. CRAMER. I am really anxious to stay with you as you work through that because one of my frustrations, and it sounds like others' frustrations, has been your ability to really predict and evaluate and having the independence that is needed. We need that process to be as independent as it can be in order to keep the proper check and balance that we need.

Will TVA provide funding to the IRP review group?

Mr. CROWELL. Yes.

Mr. CRAMER. So TVA will actually fund the review group?

Mr. CROWELL. As long as it is done in partnership with us. Now what I don't like is giving grants to people to go out and do their own study. I don't like that. But the issue here, as I understand what you're asking, is would we provide money to the review group to go out and seek consulting help to look at what our numbers are and that sort of thing. The answer to that is yes.

Mr. CRAMER. All right. Back to Watts Bar 1. Will that be completed by mid-1995 in your opinion?

Mr. CROWELL. Yes.

Mr. CRAMER. And in future decisions—I'm trying to lay this ground work to come to Bellefonte, which of course is in my district—how do you see this process working with your decisions about construction, tough decisions you have got to make about debt. You have got Watts Bar unit 2, you have got Bellefonte units 1 and 2 that have been talked about off and on; it has kind of been an up and down schedule. Where are we with Bellefonte or can you say at this time? And if you can't say, what is it dependent upon?

Mr. CROWELL. Okay. Let me go back and pick up on the construction projects. You made a comment about how serious a decision it is, and it is a very serious decision. If we decided to cancel Watts Bar and Bellefonte, we would have to raise rates 16 percent. So obviously if we make a decision involving that, we need to be very careful what we do.

Right now for Bellefonte, our plan is to spend just enough money on Bellefonte to preserve it as an option to be a nuclear plant at the end of the IRP. There are essentially three things that could happen to Bellefonte in the future. One is that we could decide to cancel it. Another one is that we could decide to convert it to another source of power. The third one is that we could make a decision to build it as a nuclear plant. So I can't tell you at this point

which option is going to be the one we choose, but there are only so many options that are available for Bellefonte.

Mr. CRAMER. Right. And I have to understand that, and I do understand that. But over what course of time could you project for me that those decisions might be made?

Mr. CROWELL. The IRP process will bring that to some conclusion. I served at TVA for nine years as a member of the staff and one of the things I remember during my service there is that any time the board surprised people they got into great difficulty as a result of that. And what I am trying to do here with Phase One and Phase Two of our leadership plan for this board is to do my very best to include people in the process and not surprise people. It doesn't mean we can always be successful with that; there are going to be times when we do surprise people. But I think making a decision involving Bellefonte in the IRP process and doing it as a deliberate process is much better than me getting the staff together and getting a few consultants together on the twelfth floor in Knoxville and making that decision and then announcing it to everybody else. That just doesn't work.

Mr. CRAMER. Is it possible in this process that you could decide that after you complete Watts Bar unit 1 that you will complete Bellefonte unit 1 and not complete Watts Bar unit 2 and not complete Bellefonte unit 2?

Mr. CROWELL. Absolutely. Any scenario like that is possible, yes.

Mr. CRAMER. All right. How much of your electricity right now comes from nuclear?

Mr. CROWELL. Last year, and of course some of our units were down, we got 10 percent of our generation last year out of nuclear, about 12 percent out of hydro, and I believe that leaves 78 percent for fossil.

Mr. CRAMER. TVA has consistently over-estimated the growth of electricity demand in my area and in the entire Valley area for the past two decades. Do you see that changing? If so, why?

Mr. CROWELL. Well as I mentioned, prior to 1985 we did not have an illustrious history on load forecasting. But since 1985, the TVA staff has done a very good job of doing that. Now talking about your area in Alabama, we cover I think about 16 or 17 percent of the land area in Alabama. If my memory is correct, from the ten year period from 1981 to 1991, about 32 percent of all the new jobs created in Alabama went into our service area. So our record there is fairly good in that respect. So we are getting significant growth in North Alabama.

Mr. CRAMER. Which of course we want to continue to see happen.

Mr. CROWELL. Right. And that's why it is important to keep rates stable, Congressman.

Mr. CRAMER. I want to briefly move to contracting out as an issue. I assume, speaking very generally and very quickly, that was a decision that was made in the past in order to save money. Are you relooking at any of the contracting out issues, because I see signs of watering down. For example, I think you are talking now about engineers out of Chattanooga that are going to be available on a regional basis that will be full-time TVA employees. Are you having any reservations about the contracting out issue? Are you looking at any angles of that again?

Mr. CROWELL. I don't have any problem with contracting out jobs if it makes economic sense. If it is something that we need to do to be more efficient, I think we should contract jobs out. What we did in adopting the policy by the board is insist that the employees and the union representatives have a say in it before the decision is made. So we did not change any policy of whether we contract out or don't contract out, we simply changed the process by which that decision is made to involve our employees in it.

Mr. CRAMER. I have some concerns in looking at that process, and my constituents raise these from time to time, that we're seeing here a process created where we see the larger companies are benefitting from the contracting out, the companies that can hire temporary employees, and that that has worked an unfairness on some of the TVA employees. I just raise that as a concern and just want you to be aware of that.

Mr. CROWELL. Yes. Thank you.

Mr. CRAMER. I want to tell you as well that I applaud your goals of particularly putting your people first. I think already you have shown signs of people getting that message. So I want to encourage you to continue. I know you are bending over backwards to get around the TVA area and to make your presence known and to give them the impression that you are going to pay attention to issues that the organization hasn't been able to in the past. A lot of people are encouraged by that but they want to see more of that happen.

With regard to your Valley first, there are a lot of my business constituents who are anxious to see that you do follow through with that and that they do get a fair shot at the business of TVA.

Mr. CROWELL. Thank you.

Mr. CRAMER. Thank you, Mr. Chairman. That's all for now.

Mr. BORSKI. The Chair would now recognize the gentleman from Illinois, Mr. Poshard.

Mr. POSHARD. Thank you, Mr. Chairman. I just want to ask a couple of questions. Going the other direction here toward some of the coal issues, 76 percent of your energy is produced right now by coal-fired plants. Is that right?

Mr. CROWELL. It was 78 percent last year. But it is typically a little lower than that because we get more nuclear generation. But last year it was 78 percent.

Mr. POSHARD. Okay. Are your coal-fired plants equipped at this point in time with the kind of clean coal technologies, scrubbers or otherwise, that will bring you into compliance with Phase Two of the Clean Air Act, or do you mostly burn low sulphur coal that puts you already in compliance?

Mr. CROWELL. We are not in compliance yet with Phase Two and that is going to end up in a \$2.2 billion undertaking. Phase One we have completed, obviously, and I think Phase One cost about \$650 million to do it. So we are very interested in buying coal from our region, there is no question about that, for a lot of reasons. We are trying things like mixing coal in order to cut down on the sulphur content of the total burn and generation of it. So there is a lot more that we need to be doing with that. Of course as Congressman Barlow mentioned, we have a facility at Shawnee which is doing research into trying to find solutions to burning high sulphur

coal. So we will continue those efforts very aggressively because it has been our fossil program that has been the backbone of our system for a long time and we know how important that is.

Mr. POSHARD. I represent southern Illinois and have a lot of high sulphur coal mines that have shut down there as a result of the Clean Air Act. About 60 percent of our mines are inactive right now just because of that one Federal act, and several thousand people are out of work. I would hope that you could continue to take a look at the high sulphur coal areas because mixing some of the technology that we can bring on line now will enable us to use that coal. And I am sure that Tom probably related that to you earlier.

I don't know why, at the Federal level, we can't seem to ever get any administration to back clean coal technology in this country. We have 300 years of coal under the surface of this Nation right now, 300 years of providing the entire energy needs of this country if we will just find a way to use it. A lot of that is high sulphur coal. We talk about nuclear, we talk about hydroelectric, all these other things: we have got all the energy we want if we will find a way to help us develop a cost-effective clean coal technology program in this country. And I want to applaud you for using coal. I think you should continue to take a look at this as your primary source. But any way that we can help with respect to developing those kinds of programs and encouraging entities like yourself to continue to use that coal, we want to do that.

Are you buying low sulphur coal in the region or are you having to go outside the region to do that at this point in time? Are you buying much western coal?

Mr. CROWELL. We're buying some western coal and we're getting the low sulphur content from the western coal. We are doing some mixing in order to try to use Kentucky coal in the process. But we don't get much low sulphur coal out of Kentucky, as you know, so I think it is a challenge to us to continue to develop ways of burning coal cleaner. And I think there are a lot of opportunities out there. There is an amazing amount of progress going on at Shawnee, and I certainly would encourage you to visit there some time. I would be happy to show you around myself if you want to come. But there are some things that we're doing which really could get at the very heart of how we can use the high sulphur content coal for the power production we need for the future.

Mr. POSHARD. I know that the conversion over to low sulphur western coal is probably good for some of the western States. Eventually that transportation cost is going to become exorbitant and I think the lower BTU content of burning that low sulphur coal is more expensive over the long haul. I am hopeful that we can look at ways to clean the coal and use it where we are as opposed to shipping in a lot of coal from out of the area.

Well, thank you. We will be happy to work with you along the way. Being from southern Illinois we use the Land of Lakes area and Barclay Dam and all those areas that you folks serve. Those are a tremendous asset to our area also and we want to applaud your efforts and the good job that you've been doing.

Mr. CROWELL. Thank you very much.

Mr. BORSKI. The Chair thanks the gentleman.

The gentleman from Kentucky, Mr. Barlow.

Mr. BARLOW. Thank you very much, Mr. Chairman, and thank you for having these hearings today. They are very helpful.

I would like to follow along on some of the points Mr. Poshard touched on just now. But first I would like to compliment you again that in your outsourcing of contracts you will be consulting with employees and the unions before you make the contract award or decide on a category of work that will be going outside of TVA. I think that is very constructive. It is going to make for good working relations and I think that will be very positive.

I also want to echo Congressman Poshard's appreciation for the work you do at Land Between the Lakes. You all do a very fine land management approach there.

Mr. CROWELL. Thank you.

Mr. BARLOW. I know it is a sensitive time with the land planning processes going through, but having watched it, at this point you are being extraordinarily sensitive to all the demands that are focusing in on that area.

The third area, again following on from Congressman Poshard, and I would like to spend a few minutes, is continuing research into clean coal burning. Perhaps these hearings might be a point at which we could do some framing for the record by submissions that you all might be able to make to us for the record of where we are today with clean coal burning technology.

I personally am not a member of this committee and have not been involved in clean air debates in this Congress for a number of years. But I am concerned that we continue aggressively the research into low cost clean coal burning technologies for the sake of our coal companies and the workers' jobs in the coal industry and for the sake of clean air. What good is it going to do us as a Nation to spend all this money on cleaning up our coal burning power plants and yet see nations such as Russia, India, Eastern Europe, South Africa, and China, where there are tremendous coal deposits, where there is going to be strong economic growth, if they bring their needs for electricity to be met by coal burning power plants and they are behind in clean coal burning technologies? We will see our air around the world continue to deteriorate even as we make heavy investments. But if we can be out in front with research, we can be creating jobs in the coal industry, we can be creating jobs in the power plant engineering industry, we can be creating a tremendous market. Maybe you can give me some response here.

Maybe I am being unfair, but I would think that there might be a tendency as a user of coal and a very large utility, there might be a little bit of reluctance to engage in this research because you might think, well, if we come up with findings on new technologies, they are just going to turn around and tell us to implement them in our power plants and that's going to affect our rate base. But I would like to say that perhaps if we go forward aggressively, we can make giant leaps.

As a lay person looking at the whole coal burning area over the last 10 or 20 years and the debates that have gone on with clean air, it seems to me that we have had an incremental type of approach, kind of an add-on type of approach of technology. Scrubbers, for example, were something that were just added on to existing plants, as far as I can determine as a lay person. Of course

they are an expense in construction, so it is simply added on to the plant. But what intrigues me is that the new technologies, such as the one at Shawnee, such as the one that is being developed now by Shell Research, are actually internal combustion type of technologies and we may find we can come up with tremendous breakthroughs of burning here that are cheaper than what we have today.

That's why I would be very encouraging of you to perhaps go aggressively from a leadership standpoint—for the sake of the coal burning utility industry, for the sake of coal companies and coal miners, for the sake of our power generating construction industry and the power generating technology fabricating industry—to exercise aggressively the leadership that Congress gave you as a directive when they established TVA and that TVA has demonstrated over the decades and perhaps convene some type of advisory boards or exploratory boards of scientists and experts on a continuing basis to help us stay abreast and stay out in front. That's been a long monologue here on my part, but could you give me some insights.

Mr. CROWELL. Let me try to respond in this way. I think that it is imperative for us not only in our country to try to find new ways to burn coal in an environmentally sound way and to look for those opportunities to continue research there, but I have no reluctance whatsoever to devote our time and energy into that even if somebody else in another country gets the technology because it will eventually help us all if we do something that affects the rest of the world.

I might say one thing here though, and I don't want to get involved in foreign policy in any way here at this discussion since I've got enough to do back in Tennessee, but there is great opportunity out there, particularly in the former Soviet States and China, for hydro-electric facilities. I think that particularly in the former Soviet States there is great opportunity to encourage that as a good way to produce power. It creates some environmental problems, of course, but not the same kind of problems that fossil does. So there is some opportunity there I think to be helpful to other countries in hydro electricity.

Mr. BARLOW. Thank you very much for that. Let me just ask again for purposes of the record, might you all give us a status report for the record and use this oversight hearing as a point at which we can get an overview going back and perhaps going forward of where we are with clean coal burning technologies—the various ones that are proving out, that have promise, that have potential, that are interesting; and what you all might do structurally from TVA's standpoint to investigate and explore and further these technologies; and what their cost and efficiency impacts might be. I think that might be a real service and that the record of these hearings might be used in a very fruitful way in coming years.

Mr. CROWELL. Yes, I appreciate that very much. I don't want to leave any impression that I am understating the importance of what you are talking about. The opportunities to burn clean coal are there. We must renew our efforts to find solutions to that. I would be more than pleased to provide a report to the committee, and I appreciate being asked to do so.

Thank you, Mr. Chairman.

[Mr. Crowell's responses to requests for additional information, may be found on p. 81.]

Mr. BARLOW. Thank you, sir.

Mr. CLEMENT [assuming Chair]. Thank you, Congressman Barlow.

We have got several more questions, Mr. Chairman, of the board members. Why is TVA relying almost exclusively on nuclear power to meet future electric demand when TVA electric utility competitors are using conservation and demand-side management practices, customer cogeneration, and constructing peak load gas-powered turbine units?

Mr. CROWELL. Obviously, Mr. Chairman, we should be looking at those possibilities too, and we plan to do that in the IRP. There is no question that there are great opportunities for us to do things differently and do them cheaper and provide the power that is needed for the future. We plan to do that in the IRP.

Mr. CLEMENT. In your testimony you say that TVA will not exceed the statutory \$30 billion debt limit until the next decade. However, TVA estimates it will spend \$5.5 billion in capital expenditures in the next three years. Wouldn't these expenditures added to the current TVA debt of \$25.3 billion put TVA over the debt limit by 1996?

Mr. CROWELL. We do not expect to exceed the debt until after the year 2000 even if we continue the construction program as now planned, although that's up to discussion in the IRP. We are spending about \$1.7 billion a year in capital on the program at TVA but most of that is generated from revenues. We are only looking at going to outside borrowings on about \$600 million a year, which certainly would not run us above the cap until after the year 2000.

Mr. CLEMENT. TVA does not include defeased debt under the \$30 billion statutory debt limit. The Office of Management and Budget will issue a formal ruling soon on whether defeased debt should be counted toward the debt limit. If OMB decides that defeased debt counts toward the debt limit, how will this affect TVA's operating plans?

Mr. CROWELL. Mr. Chairman, I have looked into the defeased debt question personally and I have an opinion from an outside legal firm and our outside accountants, Coopers & Lybrand, that the defeased debt should not count toward the debt ceiling nor should it be included on our balance sheets as such. I don't know what OMB is going to decide on this issue. I would expect that they would agree with us that the defeased debt should not count toward the debt ceiling. But let me just reassure you here so that you see where we are, even if they were to say it counted, it is not a problem for us because \$3 billion of the defeased debt matures in October of this year and we would buy those bonds. So it would not be a problem if they made some sort of decision, Mr. Chairman, saying it counted toward the ceiling. We have a number of ways of dealing with that until October 1st when we pay off \$3 billion of it.

Mr. CLEMENT. Mr. Duncan.

Mr. DUNCAN. Thank you, Mr. Chairman.

We have some later witnesses of course and they are sitting here listening to everything you are saying and I am sure they are going to respond to it. And I don't want to get a debate going here but I do want to maybe get your response to some things that they are going to say later. We have been supplied all sorts of figures that say the total TVA debt is \$25.3 billion or somewhere in that area.

Mr. CROWELL. Yes, that's right.

Mr. DUNCAN. A later witness though will say OMB has the debt at over \$28 billion. Where does he get that figure? Is he adding in what you have referred to as this defeased debt? To be honest with you, I was a lawyer and a judge before I came to Congress and I don't know what defeased debt is. How is that different from the regular debt?

Mr. CROWELL. Here is what the debt is now. It is \$25.3 billion. We have \$4.5 billion in what we call insubstance defeasance on the debt. What we did is we set up an irrevocable trust and we purchased Treasury securities with \$4.5 billion and bonds that we sold to put in that trust to redeem the bonds when their call date comes up. Over the past, we have used this mechanism on a substantial amount of debt. In other words, we borrow money and put it in a trust and redeem the bonds when they mature. What I was saying is that we now have \$4.5 billion in defeased debt, \$3 billion of that debt comes due in October, and the other \$1.5 billion comes due two years after that.

Mr. DUNCAN. And the \$4.5 billion is not counted in the \$25.3 billion?

Mr. CROWELL. Because it is in an irrevocable trust and is in Treasury securities, the law firm that we asked to look at this said it should not be counted. And our accountants, Coopers and Lybrand, said that nobody ever carries that on their balance sheets. There are certain accounting standards, and there are a lot of accounting standards on this particular issue of defeased debt, and Coopers and Lybrand says it should not count on the balance sheet.

Mr. DUNCAN. The same witness says that TVA is presently adding to this indebtedness at over \$1 billion a year. Yet, you say that TVA will not cross this \$30 billion threshold until after the year 2000. So there is some variance there.

Mr. CROWELL. There really isn't because we put about \$1.7 billion into capital projects each year but a substantial portion of that is generated from revenue, it is not generated through the sale of bonds. The sale of bonds, which is what goes into our debt, is going to average about \$600 million a year between now and the year 2000.

Mr. DUNCAN. So it is going to average about \$600 million a year?

Mr. CROWELL. That's \$600 million a year until the year 2000 is what our expectation is on new borrowings outside. The rest of our capital will come from internal revenue, not from the sale of bonds.

Mr. DUNCAN. I think that maybe the most significant statement that you've made here so far today is what you said a few minutes ago when you said, if I understood it correctly, "If you shut down right now Watts Bar 1 and Bellefonte, that you would have to increase the rates by 16 percent."

Mr. CROWELL. If we shut down all four units, Watts Bar units 1 and 2 and Bellefonte units 1 and 2, we would have to increase rates 16 percent immediately.

Mr. DUNCAN. I am sure that is a statement that will be disputed later on. How did you arrive at that 16 percent figure?

Mr. CROWELL. Well, if you look at how much debt there is—the \$6.1 billion at Watts Bar 1, there is \$1.6 billion at Watts Bar 2, and then there is roughly \$4.5 billion at both units at Bellefonte—and if you have to start writing that debt off immediately—and the figure I gave you, the 16 percent is a write-off over 10 years; of course if you want to write it off over 20 years, it would be 8 percent instead of 16. But if you don't get any revenue out of those plants, you have to start writing the debt off. So the percentages I gave you are based on having to write the debt off because you would get no revenue out of them to off-set any of the costs there.

Mr. DUNCAN. Congressman Clement just asked me to ask you to submit for the record the details of how that figure was arrived at.

Mr. CROWELL. Oh, sure. Be pleased to do so.

[Mr. Crowell's responses to requests for additional information, may be found on p. 94]

Mr. DUNCAN. Let me read you another statement, actually two statements from a later witness. "In 1988, TVA stood before the committee and stated that Watts Bar would be up and running within a year. Five years and billions of dollars later, TVA is before this committee again with the same message. As troubled a history as the Watts Bar plant has, TVA is now willing to 'bet the ranch' that unit 1 will get an NRC license and run better than any other nuclear units. If TVA loses the gamble, the real losers will be the ratepayers of the Tennessee Valley."

Now, do you feel that TVA is betting the ranch on the Watts Bar facility? And do your calculations in regard to Watts Bar require that Watts Bar run better than any other nuclear facility in the country?

Mr. CROWELL. Let me first of all say that saying 'bet the ranch', as I understand what it means to bet the ranch, to say that applies to one nuclear unit at TVA is a bit of an exaggeration obviously. We must consider the fact that when I arrived on the board, unlike previous boards, Watts Bar unit 1 was 99 percent complete. I am only making a 1 percent decision here on Watts Bar 1. As I said earlier, if you look at a 50 percent capacity factor, which has never been lower than despite all the difficulties TVA has had with its operating plants in the past, that it would generate somewhere around \$10 billion or more over the 40 year life of the plant.

We have got a very simple decision here at Watts Bar 1. Do we shut it down and raise rates or do we try to get some revenue out of it? I really hate to suggest that we ought to use common sense here on Watts Bar 1 because common sense is not viewed too well in many areas, but if you're sitting here as this board and you've got a plant that is 99 percent complete and is expected to have hot functional testing this spring, why would you stop it? I just don't understand why we would do that. Despite any other consideration, it just doesn't make common sense for me to do that.

Mr. DUNCAN. Another question that has been touched on a little bit earlier, there is another witness, Doctor Edward Passerini, who

will testify later that TVA's power reserve margin exceeds that recommended by the Federal Power Commission. You testified earlier that there was a peak day, January 18 I think, where the reserve was less than 5 percent. What he is going to say is that the recommended level is 18 percent and that TVA has a reserve margin of 27 percent, and that has been mentioned. But he also contends that if you add the two units at Watts Bar, the reserve margin is increased to 37 percent. Is that correct?

Mr. CROWELL. I don't know where he gets those numbers, Congressman. The facts show that in that one example I used it was around 5 percent. In actuality, that is what the margin was that day.

Mr. DUNCAN. We have heard the testimony and the figures I think are now that 76 percent is generated from the coal burning facilities or the fossil fuel, 15 percent from the hydro electric, and 9 percent from nuclear. Is that correct?

Mr. CROWELL. Last year it was 10 percent nuclear, 12 percent hydro electric, and 78 percent from fossil.

Mr. DUNCAN. If we follow the nuclear plans envisioned by this board, and one of these later witnesses says that you have vowed to spend over \$7 billion on nuclear power programs in the years ahead, although I am not sure where that \$7 billion is coming from. Is that \$7 billion figure accurate?

Mr. CROWELL. I am just assuming that somebody is trying to add up the costs of completing Watts Bar and Bellefonte. But keep in mind that this board has made no decision to do that. So I am not sure what that is referring to.

Mr. DUNCAN. We have been given figures that it would take \$0.5 billion to complete Watts Bar 1, \$1.1 billion to complete Watts Bar unit 2, and \$3 billion to complete Bellefonte. That would be about \$4.6 billion.

Mr. CROWELL. It will take about \$1.2 billion or so to finish Watts Bar 2, and take \$3.5 billion for Bellefonte, and Watts Bar 1 takes \$500 to \$550 million to complete, if my memory is correct.

Mr. DUNCAN. Assuming that we go forward with what you wish to do, let's say five years or ten years down the road, looking at your crystal ball, what will TVA look like? With the 76 percent and the 14 and the 10 percent or the 75 and 15 and 10, whatever it is, what percentage will be fossil fuel and what percentage will be hydro and what percentage will be nuclear?

Mr. CROWELL. Congressman, I wish I could give you an answer to that, but that is what we hope the IRP will help us do and we're just getting into the process. So I will be much wiser on that issue I think later than I am now.

Mr. DUNCAN. All right. Thank you very much.

Mr. CLEMENT. Mr. Mineta, our full committee chairman; a great chairman, too.

The CHAIR. Thank you very much, Mr. Clement.

Just out of curiosity, how many in the room are going to be witnesses later on during the course of the day?

[Show of hands.]

The CHAIR. Okay. How many are with either co-ops or a municipally owned distributor network?

[Show of hands.]

The CHAIR. Then how many are TVA employees?

[Show of hands.]

The CHAIR. Okay. Let me ask you, Mr. Chairman and to the members of the board, given your structure, who are you accountable to?

Mr. CROWELL. We are accountable to Congress, obviously. That is who we are accountable to from a legislative standpoint. We are accountable to the customers we serve, to the people of the Valley, to OMB, and to various other groups. There are a lot of groups that practice oversight over us on a regular basis I might say, Mr. Chairman. [Laughter.]

The CHAIR. We're used to that here. [Laughter.]

In terms of your reorganization, you are bringing on a chief operating officer, senior nuclear advisor, I've forgotten what your testimony—

Mr. CROWELL. Chief nuclear advisor, yes.

The CHAIR. A chief nuclear officer as well as a nuclear advisor, is that correct?

Mr. CROWELL. Right.

The CHAIR. Let's say just using first of all the chief operating officer, what authority will that individual have?

Mr. CROWELL. The chief operating officer is the chairman of the operations committee. The operations committee is made up of the top and senior executives at TVA and the recommendations to the board come through the operations committee, and therefore it is chaired by the chief operating officer. So that everything that comes to the board for a decision essentially comes by the chief operating officer.

The CHAIR. And the chief operating officer reports to whom?

Mr. CROWELL. Reports to the board.

The CHAIR. Now as chair, are you the CEO?

Mr. CROWELL. Essentially, if we had a CEO, I guess that would be me right now. We are looking at moving more toward a policy board, and I would not foreclose changes in the future in order to accomplish that. But right now that is how we are structured.

The CHAIR. So who does Congress look to in terms of accountability and responsibility?

Mr. CROWELL. You look to the three of us.

The CHAIR. To the three-person board?

Mr. CROWELL. Yes.

The CHAIR. And to the extent that knowing a little about your background and the fact that you are a person who tries to work by consensus, here you have a three-person board or two other colleagues you are going to have to be working with very closely, do you think that is practical?

Mr. CROWELL. I must say, Mr. Chairman, it has worked very well for the past six years because we've kept rates down and the previous boards have made very good decisions about some of the operating expenses and what we've done competitively. It is our expectation to keep rates down another four years and to try to operate more as a business and operate in a business-like manner. So I think that it obviously is working fairly well right now.

The CHAIR. But the problem I see is that I see TVA sort of on its own. It is in the utilities business, I take it that is what you

really are all about, economic development, flood control was part of that charge, but in terms of reality of today you are really in the power business. And yet I see other power investor-owned utilities putting much more emphasis on the kinds of things that Mr. Duncan and Mr. Clement were talking about in terms of cogeneration or conservation, alternative energies, other kinds of things. But I see TVA sort of going merrily on its way, doing its own thing.

That's why I asked the basic question about to whom is TVA accountable. So you say, yes, Congress. Well, that's true, and to the extent that I have been Chair of this full Committee now for fourteen months, it has been six years since one of our I guess you might say operating entities has come in to talk to this 63 member board of directors.

Mr. CROWELL. First time we've been invited, Mr. Chairman. We will be happy to come back any time you would like.

The CHAIR. First time in six years?

Mr. CROWELL. Correct.

The CHAIR. Well, maybe as the chairman of the board of this 63 member Public Works and Transportation Committee, we will have to shorten that time period between invitations. [Laughter.]

Mr. CROWELL. All right. I understand.

The CHAIR. The other thing I would like to just ask about is you were talking about if you were to cancel Browns Ferry or Watts Bar and Bellefonte and all these that the costs of cancelling those contracts would really be more than if you were to go ahead and proceed with the implementation or going ahead and constructing those. Are you pretty comfortable with those figures that you've been given?

Mr. CROWELL. Are you talking about Watts Bar 1, is that what we're talking about here? I am obviously not comfortable with Watts Bar 2 and Bellefonte 1 and 2 at this point. But to answer your question, I am comfortable that the figures I have on Watts Bar 1 are good figures and I am comfortable that we should proceed that way.

The CHAIR. We're sort of going through that now. Congress cancelled the Superconducting Super Collider and the buying out of those contracts was very, very expensive. Sometimes we get backdoored into keeping things going because someone comes up with a figure that says, yes, if you want to kill Landsat that is all right but it is going to cost \$2.1 billion to cancel it, and maybe it is \$3.1 to complete it. So everyone says, heck, for \$2.1 let's go ahead and proceed with it. What about in terms of Watts Bar 1, Browns Ferry 3, you have been given some estimated costs of finishing those versus cancelling those units.

Mr. CROWELL. Browns Ferry unit 3 has a license. It is a licensed unit and we are trying to get it operating.

The CHAIR. That is the one you are looking at restarting.

Mr. CROWELL. Right. Absolutely. It has a license and is an operating asset. The only one of our units under construction that we're proceeding with now is Watts Bar 1 and we're doing that, as I said, because it is 99 percent complete and hot functional testing is anticipated this spring. It is essentially a completed facility and will be an operational asset prior to the completion of the IRP. So that

is why we are proceeding with it. So there is only one unit under construction that we are really proceeding with at this point.

The CHAIR. Maybe as you submit this other material that has been asked for, maybe if I could ask you on what methodology TVA used to come to the decision on finishing Watts Bar 1 and restarting Browns Ferry 3 rather than cancelling these units.

Mr. CROWELL. I would be happy to do so. We will provide that, yes, sir.

[Mr. Crowell's responses to requests for additional information may be found on p. 81.]

The CHAIR. The staff in preparation for this hearing had asked for other data. Evidently we've been having some difficulty in getting that. I am not sure of all the specifics on the information that we've been requesting, but for whatever reason we haven't gotten it, whether it is reluctance or whether it is just a question of timeliness, but we have asked on price data, we've asked about some others. But I think what I will do is submit those to you in writing so that you can respond to us in writing.

Mr. CROWELL. I am not aware of any information being requested by the committee that has not been forthcoming. I am very concerned, Mr. Chairman, about any possibility that it has not been forthcoming. So I would very much appreciate knowing what the difficulties were from the committee because I want to correct those. This committee should have anything that it wants.

The CHAIR. Six years ago was the last time we sent mail to you evidently, and maybe you had a little difficulty finding out where to send it. [Laughter.]

Mr. CROWELL. But you can be assured I will personally be sure it is responded to, Mr. Chairman.

The CHAIR. Let me also say, Chairman Crowell, that given the fact that you are new on the job, Mr. Hayes is new on the job, you've got an old hand—I shouldn't say "old"—you have a person with experience there in Mr. Kenney, but from my perspective as Chair of the full Committee on Public Works and Transportation, I think we will probably be keeping a little shorter leash on you and not wait six years for you to come back in. Thank you very much for being here.

Mr. CROWELL. Okay. Thank you very much.

Mr. CLEMENT. Mr. Cramer, State of Alabama.

Mr. CRAMER. Don't want the State of Tennessee ganging up on me here; I've got to hold out.

I want to thank the chairman for his comments just then about us keeping TVA on a shorter leash. I think that will allow us to have the kind of dialogue more consistently that we need to have so that members of the committee feel like we do get to have a chance to have input and questions asked and answered.

Along with that, the issue of reorganization. I have been hearing since I've been here that TVA has been reorganizing and I have been kind of waiting on that and participating in that and hoping to see that finally happen. So I hope to see that finally happen. With the chart that you've given us, the resource group is now under the chief operating officer, Joseph Dickey. Is that correct?

Mr. CROWELL. That's correct.

Mr. CRAMER. And under this structure then the chief operating officer accounts directly to the board?

Mr. CROWELL. That's correct.

Mr. CRAMER. So consequently, it would be through that process that decisions would be made about where TVA invest the resource monies that are appropriated by Congress in the various districts.

Mr. CROWELL. That's correct.

Mr. CRAMER. You have given me some information thus far about the amount of money spent, for example, in North Alabama and your 16 county territory there. I would like to know more about that as you make those decisions to spend those monies throughout the entire State's areas.

Mr. CROWELL. Okay. I would be happy to supply that. If you like, I will submit it for the record right away.

Mr. CRAMER. Thank you.

[Mr. Crowell's responses to requests for additional information, may be found on p. 97.]

Mr. CRAMER. One additional question beyond that. Did I understand you earlier, you have a 16 county jurisdictional area in Alabama. Is that right?

Mr. CROWELL. No. I think if you look at land area in Alabama, I think it is about 16 percent of the land area is TVA territory.

Mr. CRAMER. Can you sell outside that land area?

Mr. CROWELL. No.

Mr. CRAMER. Okay. Thank you, Mr. Chairman. That's all I have.

Mr. CLEMENT. All right. Anything, Mr. Chairman, you or Mr. Kennoy or Mr. Hayes want to add before we end this part of the hearing?

Mr. CROWELL. I would just like to say I appreciate very much the opportunity to appear before this committee. I look forward during my service on the board to having the opportunity to spend more time with all of you and to let you know what we're doing. It is my expectation that we will be inclusive in the way we manage TVA for the future. So I look forward to those opportunities and I appreciate being here very much. Thank you.

Mr. CLEMENT. Your testimony, your information all of you have shared is most helpful.

Thank you.

[Subsequent to the hearing, the following was received from Mr. Crowell:]

RESPONSES TO QUESTIONS SUBMITTED
BY THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

Question 1: In your testimony you said that canceling the Watts Bar and Bellefonte nuclear units would cause an immediate rate increase of 16 percent. What data did TVA use to calculate this projected rate increase?

Answer: As stated in the testimony, TVA has the following amounts invested in Watts Bar and Bellefonte:

Watts Bar Unit 1	\$6.1 billion
Watts Bar Unit 2	1.6 billion
Bellefonte	<u>4.5</u> billion
Total	\$12.2 billion

Estimating salvage value and site costs that could be used for future units to be \$3.5 billion, a total write-off would amount to \$8.7 billion. Spread over 10 years this would amount to \$870 million per year rate increase. This \$870 million divided by 1993 TVA revenues of \$5.3 billion would yield a 16.4 percent increase in rates.

Question 2: In your testimony you said TVA's reserve margin on January 18, 1994, was 5 percent. Does this reserve margin reflect the forced outage at the Cumberland Steam Plant and Sequoyah Unit 1? What would the reserve margin have been if the Cumberland Steam Plant and Sequoyah Unit 1 had been operating?

Answer: TVA's reserve margin on January 18, 1994, was actually less than 5 percent. The peak load was 24,723 MW and the capacity including Cumberland Unit 1 and Sequoyah was 25,689 MW. The reserve margin was 3.9 percent.

Question 3: In your testimony you said the TVA Board may hire an outside consultant to advise the Board while TVA develops an Integrated Resource Plan (IRP). When will you decide whether to hire an outside consultant?

Answer: The TVA Board plans to hire those consultants necessary to produce an integrated resource plan of the highest quality. The TVA Board will determine whether to hire a consultant to advise the Board on the Integrated Resource Plan in the near future.

Question 4: In your testimony you said you would be willing to give funds to the IRP Review Group to hire outside consultants. Have you determined how much money will be made available to the IRP Review Group?

Answer: TVA plans to make our methodology assumptions, data, and the results of analyses performed by TVA and outside consultants available to the Review Group. If the Review Group, in partnership with TVA, feels that they need outside help to assist them, it would be appropriate at that time to determine the amount and type of assistance needed.

Question 5: In your testimony you said all nine nuclear units would be included in the IRP process. Did you mean that the IRP could determine that all of TVA's nuclear units would either be shut down or canceled in favor of less costly generating or conservation alternatives?

Answer: Projections for all existing resources including nuclear, fossil, and hydro facilities are examined in the IRP process and Bellefonte Units 1 and 2, Browns Ferry Unit 1, and Watts Bar Unit 2 are compared to other options or alternatives, in essence all nine nuclear units are included in the process. However, Watts Bar Unit 1 is 99 percent complete and Browns Ferry Unit 3 is nearing restart and both of these units are expected to be operational prior to or near the completion of the IRP process. The IRP could examine whether any of TVA's existing nuclear, fossil, and hydro units could be retired in favor of less costly alternatives if such alternatives were available.

Question 6: In your testimony you said the costs of completing Watts Bar Unit 1 and restarting Browns Ferry Unit 3 were less than the costs of cancelling the units. What will be the cost of generating electricity at these units, and is that cost lower than that of meeting TVA's power needs through conservation and demand side management, customer cogeneration, and using peak load gas powered turbines? What assumptions did TVA make about the price at which the electricity generated by these units could be sold? Are these prices based on sales inside the TVA service area or outside the service area? What capacity factors did TVA use to determine it was less costly to generate electricity at Watts Bar Unit 1 and Browns Ferry Unit 3?

Answer: As indicated in other testimony, the units mentioned here, Watts Bar Unit 1 and Browns Ferry Unit 3, are both scheduled for completion or return to service prior to or around the time the integrated resource plan is completed. Growth in the Tennessee Valley Authority system demand and tight power supplies indicates the need for additional capacity in 1995."

Watts Bar Unit 1 will meet these needs. Browns Ferry Unit 3 will meet additional needs in the 1996-1998 time period.

Generation from alternative sources of power of equivalent magnitude would cost more than either of these nuclear units. Based on the incremental costs of completing and operating these units, the cost of generating electricity in this first year of operation will cost 2.1 cents per kWh from Watts Bar Unit 1 and 2.8 cents per kWh from Browns Ferry Unit 3. A cogeneration combined cycle unit would cost approximately 3.5 cents per kWh in the first year. Conservation and demand-side management is estimated to cost from 2.5 to 3.5 cents per kWh. Just the production cost of peaking gas combustion turbines is estimated to be 4 cents per kWh which is greater than the cost of Watts Bar Unit 1 or Browns Ferry Unit 3.

The price of sales from TVA used in the referenced analysis are equivalent to the average price of electricity that TVA receives from its customers, 44.0 mills per kWh in 1995. This rate is constant through 1997 and escalates at 2.8 percent after 1997.

These prices are based on sales that could occur within the TVA service area.

Based on the incremental cost to complete and the lifetime operating cost, the break-even capacity factor for Watts Bar Unit 1 is 35 percent and for Browns Ferry Unit 3 is 55 percent.

Question 7:

In your testimony you said TVA load forecasting has been much better since 1985. What data did TVA use to calculate the current load forecast of 2.3 percent, which, according to data compiled by the North American Reliability Council, anticipates the highest load growth in the nation? The U.S. Census Bureau projects the population of Florida to grow twice as fast as the population located within the TVA service area. Yet TVA's load forecast exceeds the load growth projected for Florida. How do you justify TVA's high load forecasts given the lower population growth rate of the Tennessee Valley?

Answer:

Part of this question is based on the incorrect premise that TVA's load forecast is higher than Florida's. In fact Electricity Demand and Supply 1993-2002, published by the North American Electric Reliability Council in June 1993, shows electricity demand growth of 2.6 percent for Florida and 2.3 percent for TVA in the period 1992-2002.

The data requirements for TVA's forecast are substantial. We begin with a national forecast prepared by DRI/McGraw Hill, a well-recognized national forecasting firm. From their forecast a regional economic forecast is prepared,

considering structural differences in the regional and national economies and recent trends, such as the rapid growth of automobile related manufacturing in the TVA area.

Included in these forecasts are employment and product forecasts for various industry groups and population growth and income forecasts. The price of TVA electricity is forecast using TVA's system planning and financial models. The price of natural gas, which is an important competitor for electricity, is forecast by using published national forecasts and analysis by TVA's Fuels Planning Staff. These three factors of economic trends, the price of electricity, and the price of natural gas, are major drivers of the forecast.

A number of other factors are also considered. Recent trends in electricity use in various industries and by households are examined, using data from TVA's periodic customer surveys and other sources. Mandated efficiency standards such as those established by the Energy Policy Act of 1992 are used to calibrate average appliance energy use and market shares. Market driven trends in efficiency, such as the large recent improvements in refrigerator efficiency are also considered, as well as new uses for electricity, such as the growth in computer use throughout the commercial sector.

For our larger industrial customers, industries studies are conducted to judge the future prospects both for the industries represented by these customers and the relative position of our customers in their industries.

Question 8: On a staff trip to Chattanooga, Tennessee, Subcommittee staff were told that TVA demand side management measures were going forward during the IRP process. In your testimony you said TVA use of demand side management would be determined by the IRP. Is TVA implementing a demand side management program? If so, what demand side management measures has TVA undertaken?

Answer: TVA is proceeding with the development of plans for demand side management programs consistent with our intent to not let the IRP prevent TVA from providing necessary customer service.

Currently, we are developing plans to implement six demand side management programs in 1994. These programs are 1) a High Efficiency Heat Pump program which is designed to promote quality installations of higher efficiency heat pumps; 2) an Energy Efficient New Homes program which will promote higher weatherization and equipment efficiency standards; 3) a New Manufactured Housing program to promote energy efficient design and improve HVAC components; 4) a Residential Lighting Catalog to promote

the purchase and installation of high-quality compact fluorescent lamps; 5) Low Income Demonstrations to identify the best approaches for meeting the needs of low income consumers; and 6) an Energy Information Campaign to provide information on energy-use issues. These programs have been under development for over a year and are proceeding towards a roll-out in mid 1994.

In years beyond 1995, development and expansion of these programs along with many other demand side management programs will be considered in the IRP.

Question 9: What authority will the Chief Operating Officer exercise over TVA managers who report directly to the TVA Board, and what input will the Chief Operating Officer have in the decisions made by these managers?

Answer: TVA recently restructured top management positions to create a new management team and to focus efforts on accomplishing TVA's three strategic goals. The TVA Board believes it cannot be TVA's captain and crew. The Board therefore appointed highly experienced executives to lead TVA's daily operations so the Board can concentrate on TVA's strategic direction.

TVA's top officers include a Chief Operating Officer, a Chief Administrative Officer, and a Chief Nuclear Officer. The Chief Operating Officer is responsible for all TVA operations, other than the nuclear program, which reports directly to the TVA Board. The COO also chairs the Operations Committee, TVA's leadership team of top executives. The Operations Committee oversees every aspect of TVA's operations, and brings recommendations to the Board for decisions.

Question 10: How much of TVA's current debt was incurred to finance the nuclear program?

Answer: TVA's total investment in nuclear generating plant assets is approximately \$17 billion. Of this amount, approximately 75 percent, or \$13 billion, came from borrowed funds.

Question 11: How much has TVA invested in the nuclear program since its inception?

Answer: TVA has invested \$23.4 billion in its nuclear program.

Question 12: What is the current value of the property, plant, and equipment of TVA's nuclear facilities?

Answer: The current book value of TVA's investment in nuclear facilities is approximately \$17 billion.

Question 13: What assurances do we have that the IRP Review Group will be able to make independent and competent judgments of TVA's planning methods, data, assumptions, and results? To what extent will the Review Group have the capability to generate independent analysis based upon Review Group data?

Answer: TVA plans to make our methodology, assumptions, data, and the results of analyses performed by TVA and outside consultants available to the Review Group. If the Review Group, in partnership with us, feels that they need outside help to assist them, TVA is willing to make money available to hire consultants to help the Review Group with independent analysis.

Question 14: Please explain why TVA has no plans to reduce its long-term debt.

Answer: TVA anticipates that it will continue to grow. As it grows, it needs to spend money on facilities to furnish additional electric power to its customers and to pay for mandated expenditures such as Clean Air Act expenditures. These amounts are in excess of what TVA can generate internally and, accordingly, TVA does not anticipate reducing long-term debt in the near future.

Question 15: Dr. Cordaro said that natural gas-fired combination cycle units can be brought on-line in three or four years at a fraction of the cost of nuclear generation. Do you agree with his assessment? If so, how seriously is TVA looking at these units?

Answer: TVA will be evaluating a number of alternative resources in its Integration Resource Plan, including the combined cycle capacity. This type of capacity does look promising in terms of economics and operation and will therefore seriously be considered in this plan. Of course, when evaluating new resource options, both the capital cost of the facility and the operating costs must be considered. The costs of a new combined cycle plants are expected to be less than the costs of a new nuclear plant. These types of choices will be evaluated in the IRP.

Question 16: Dr. Passerini said that TVA's power reserve margin exceeds the margin recommended by the Federal Power Commission. He said the recommended reserve margin is 18 percent, while according to his calculations, TVA's current reserve margin is roughly 27 percent counting Browns Ferry Units 1 and 3. Dr. Passerini also said that adding Watts Bar would increase TVA's reserve margin to 37 percent. Do you have any comments on Dr. Passerini's reserve margin calculations? (Attached is a copy of Dr. Passerini's written testimony concerning reserve margins.)

Answer:

Adequate reserve margins must be planned for in order to allow for forced outages, capacity deratings, peak loads greater than forecast, and any planned maintenance.

As reported to the Southeastern Reliability Council (SERC), we do not include Browns Ferry Units 1 and 3 as capacity when calculating TVA's current reserve margins. These units were shut down in 1985 for extensive repair and will not be available to generate any electricity in 1994.

Dr. Passerini's 37 percent reserve margin assumes both Watts Bar Units 1 and 2 are completed with Browns Ferry Units 1 and 3 restarted and is based on the 1992 TVA peak load of 21,980 MW. TVA's highest peak load was 24,723 MW in January 1994 and the capacity was 25,689 MW. The reserve margin was 3.9 percent.

Our reserve margin after completion of Watts Bar Unit 1 and restart of Browns Ferry Unit 3 would be only 13 percent based on the January peak of 24,723 MW and assuming zero growth when Browns Ferry Unit 3 is scheduled to be in service.

The following additional information is supplied for the hearing record at the Subcommittee's request.

Question 1: In response to Chairman Borski, TVA's financial projections through 1997.

Answer:

Power Program Income Statement
(\$ in millions)

	1993	1994	1995	1996	1997
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>
Revenue	5,276	5,381	5,390	5,506	5,625
Operating Expenses:					
Fuel and Purchased Power	1,382	1,320	1,288	1,316	1,357
Labor and Materials	1,193	1,141	1,247	1,262	1,220
Payments in lieu of Taxes	237	243	252	261	266
Depreciation	457	501	618	681	707
Other Expenses	<u>-</u>	<u>40</u>	<u>-</u>	<u>9</u>	<u>10</u>
Total Operating Expenses	<u>3,269</u>	<u>3,245</u>	<u>3,405</u>	<u>3,529</u>	<u>3,560</u>
Operating Income	2,007	2,136	1,985	1,977	2,065
Other Income and (Deductions)	23	99	101	(5)	(5)
Interest Charges:					
Interest on Debt	1,666	1,759	1,808	1,863	1,935
Amortization of Debt					
Acquisition Expense	111	107	107	104	76
Less: Allowance for Funds Used During Construction	<u>(58)</u>	<u>(131)</u>	<u>(151)</u>	<u>(134)</u>	<u>(139)</u>
Net Interest Charges	<u>1,719</u>	<u>1,735</u>	<u>1,764</u>	<u>1,833</u>	<u>1,872</u>
Net Income	<u>311</u>	<u>500</u>	<u>322</u>	<u>139</u>	<u>188</u>

Question 2: In response to Mr. Clement, the data supporting your calculation that rates would increase 16 percent if Watts Bar and Bellefonte were canceled (see previous question No. 1).

Answer: As stated in the testimony, TVA has the following amounts invested in Watts Bar and Bellefonte.

Watts Bar Unit 1	\$6.1 billion
Watts Bar Unit 2	1.6 billion
Bellefonte	<u>4.5</u> billion
Total	\$12.2 billion

Estimating salvage value and site costs that could be used for future units to be \$3.5 billion, a total write-off would amount to \$8.7 billion. Spread over 10 years this would amount to \$870 million per year rate increase. This \$870 million divided by 1993 TVA revenues of \$5.3 billion would yield a 16.4 percent increase in rates.

Question 3: In response to Chair Mineta, the methodology used to determine the cost effectiveness of finishing Watts Bar Unit 1 and restarting Browns Ferry Unit 3 (see previous question No. 6).

Answer: The methodology examined the need for power, the cost of Watts Bar Unit 1 and Browns Ferry Unit 3 compared to other alternatives, and the potential change in electric rates if TVA does not complete these units. Based on these considerations the best alternative is for TVA to complete Watts Bar Unit 1 and restart Browns Ferry Unit 3.

Watts Bar Unit 1 and Browns Ferry Unit 3 are both scheduled for completion or return to service prior to or around the time the integrated resource plan is completed. Growth in the Tennessee Valley Authority system demand and tight power supplies indicates the need for additional capacity in 1995. Watts Bar Unit 1 will meet these needs. Browns Ferry Unit 3 will meet additional needs in the 1996-1998 time period.

Generation from alternative sources of power of equivalent magnitude would cost more than either of these nuclear units. Based on the incremental costs of completing and operating these units, the cost of generating electricity in this first year of operation will cost 2.1 cents per kWh from Watts Bar Unit 1 and 2.8 cents per kWh from Browns Ferry Unit 3. A cogeneration combined cycle unit would cost approximately 3.5 cents per kWh in the first year. Conservation and demand-side management is estimated to cost from 2.5 to 3.5 cents per kWh. Just the production cost of peaking gas combustion turbines is estimated to be 4 cents per kWh which is greater than

the incremental cost of Watts Bar Unit 1 or Browns Ferry Unit 3.

In addition, based on the incremental costs to complete these units and their lifetime operating costs, Watts Bar Unit 1 will produce revenue to match costs if it operates at only a 35 percent capacity factor and Browns Ferry Unit 3 if it operates at only a 55 percent capacity factor.

Finally, canceling either of these units would increase electric rates due to the write-off of the sunk costs. The write-off of Watts Bar Unit 1 would be approximately \$600 million per year for ten years or the equivalent of an 11 percent rate increase. The write-off of Browns Ferry Unit 3 would be about 125 million per year or the equivalent of a 2.4 percent rate increase.

Question 4: In response to Mr. Cramer, how TVA determines what portion of appropriated funds will be spent in Alabama.

Answer: TVA identifies critical areas that are necessary for the agency to complete its mission. These areas are then prioritized based on many business factors, including the applicability of these projects not only on the Valley states, but also on the entire nation. The prioritization of appropriated funds is not based on the amount spent in any one state, but the effect that program has on the entire Valley and the nation.

For example, over \$34 million of appropriated funds are earmarked for the TVA Environmental Research Center in Muscle Shoals, Alabama. A major program of the Center is poultry litter utilization. Poultry is a \$30 billion dollar industry that has resulted in large volumes of litter that must be disposed of or utilized in an environmentally sensitive manner. Alabama is the second largest state in the poultry industry, and the southeastern United States accounts for 73 percent of the industry. This is a large problem where solutions can be applied across the Valley and the nation, resulting in a high priority project.

Question 5: In Response to Mr. Barlow, a report on TVA's efforts to develop clean coal technologies.

Answer: TVA has historically developed clean coal technologies, even before DOE established the Clean Coal Technology (CCT) Program. TVA designed, constructed, and operated three wet flue gas desulfurization (FGD) pilot units during the 1970s for EPA. The Center for Emissions Research (CER) was formed at Shawnee Fossil Plant to develop several dry FGD processes with EPRI and DOE cofunding. The FGD development work led to the commercial FGD system at TVA's Widows Creek Fossil Plant in 1976, one

of the earliest large commercial FGD systems in the U.S.

TVA also designed, constructed, and operated an atmospheric fluid bed combustion pilot unit at Shawnee Fossil Plant with cofunding from EPRI. This development work led to the installation of a commercial unit in 1988. The project was cofunded by DOE, EPRI, and others.

TVA designed, constructed, and operated a Texaco coal gasification process at TVA's Environmental Research Center in Muscle Shoals, Alabama, in the early 1980s with direct congressional funding. The project included carbon dioxide recovery for the production of urea. The gasification demonstration project was completed in 1985.

TVA has been an active participant in the DOE CCT demonstration program since the inception of the program in 1984.

TVA participated in a proposal for a demonstration of gas suspension absorption (GSA) flue gas desulfurization process which was selected by DOE. The process was installed in 1992 at a TVA facility near Paducah, Kentucky. The one-year test program, which was funded two-thirds by TVA and one-third by DOE, was successfully completed in 1993. TVA, using internal funds, is continuing to further test and evaluate the process for potential use on the TVA power system. A coal-fired boiler installation in Ohio was recently sold, based on the successful testing at TVA's facility. However, a lack of funding has thus far prevented the scaleup of the technology to the size typical of a commercial utility installation.

In 1991, a \$7.33 million micronized coal project for nitrogen oxide control was selected by DOE and is in the design phase. Micronized coal is coal with an average particle size of 20 microns. Because of its large surface area, it burns much like natural gas with a very stable flame. When used for reburning, micronized coal is burned above the main combustion zone with insufficient air for complete combustion. Hydrocarbon radicals are formed which reduce nitrogen oxides to nitrogen. Overfire air is supplied higher in the furnace to complete carbon burnout. Other benefits include new milling capacity which will reduce deratings due to pulverizer problems and fuel flexibility.

TVA submitted a proposal for a 265 MW coproduction demonstration project at a new site in the western part of the TVA region to coproduce electricity and urea. The proposal was not selected by DOE.

TVA has developed several other proposals for the Clean Coal Technology Program which have not been selected by

DOE. In summary, TVA has been developing clean coal technologies for over 20 years through cofunded projects with DOE, EPRI, and EPA.

Question 6: A copy of the new TVA policy on including employees in contracting decisions and the new policy on encouraging the use of contractors located in the Tennessee Valley.

Answer: Attached are copies of the TVA policy on contracting decisions and the TVA policy on utilization of Tennessee Valley region businesses.

Question 7: The Subcommittee would like periodic reports on TVA's development of an Integrated Resource Plan.

Answer: TVA will be pleased to provide periodic reports on the development of our Integrated Resource Plan. Here is a current status of the IRP process.

TVA's process to develop its long-term strategy, or Integrated Resource Plan (IRP), will guide energy planning decisions through the year 2020. This will include a short-term action plan for the next 3 to 5 years that identifies immediate tasks that need to be accomplished.

The most important objective for TVA's IRP is to maintain and enhance its competitiveness. In addition, the IRP process will initially focus on at least three important areas: (1) demand-side management, (2) generating resources, and (3) new technologies.

TVA has formed interdisciplinary teams of employees to evaluate the technical aspects of the IRP. The teams will use the expertise of outside analysts as necessary to develop the IRP. The IRP will incorporate the best practices of resource plans throughout the country. Some of the best practices to be included are: multiple evaluation criteria; broad range of demand-side and supply-side options; uncertainty; interactions among resource options, costs, rates, and sales; flexible plans; and hard-to-quantify factors such as the beneficial economic development effects of options.

An important aspect of the IRP process is participating by stakeholders-- employees, distributors, direct-served industrial customers, state and local governments, the environmental community, suppliers, and the public within the Tennessee Valley. There will be public meetings, interviews, newsletters, and a review group to provide advice to TVA on energy issues.

In keeping with TVA's environmental leadership goal, we chose to develop an Environmental Impact Statement as a part of our IRP process. In doing so, TVA is ensuring

that environmental impacts will be appropriately considered and that the process will include adequate opportunities for the public to be involved.

The IRP process will take about 2 years. It officially began in February 1994 with the publication of the Notice of Intent in the Federal Register. This marked the beginning of the scoping process. Our best estimates are that public meetings during scoping will be held from May through September 1994. Meetings with the Review Group will then be held regularly from May 1994 through February 1995. Scoping comments would be expected to be submitted. The draft plan is targeted for July through September 1995. Another series of public meetings to obtain comments on the draft plan will be held from July through September 1995. The Board plans to approve the final plan and issue a Record of Decision on or about December 1995.

QUESTIONS SUBMITTED BY MR. CLEMENT

Question 1: What is the current amount of TVA's debt?

Answer: At February 28, 1994, TVA's debt is \$24.9 billion.

Question 2: Of that amount, how much is associated with TVA's nuclear program?

Answer: TVA's total investment in nuclear generating plant assets is approximately \$17 billion. Of this amount, approximately 75 percent, or \$13 billion, came from borrowed funds.

Question 3: Browns Ferry unit 1 and unit 3 are currently on administrative hold. Are the costs associated with bringing these plants into service currently in the ratebase or are they being added to the debt to be included later in the ratebase?

Answer: TVA does not have a ratebase in the same sense as investor-owned utilities. All interest expense associated with the Browns Ferry units 1 and 3 are being paid currently by ratepayers. None of the capital costs are being deferred until the units are brought back into service.

Question 4: How much is TVA spending per day on work being done at Bellefonte Units 1 and 2, Watts Bar Unit 2, and Browns Ferry Units 1 and 3?

Answer: TVA is spending approximately \$800,000 per day on Bellefonte Units 1 and 2, Watts Bar Unit 2, and Browns Ferry Units 1 and 3. About 85 percent of this amount is for Browns Ferry Unit 3 restart.

Question 5: What are TVA's current plans for the Hartsville nuclear power plant?

Answer: Two units at Hartsville were cancelled in 1982 and the remaining two units were cancelled in 1984. With the cancellation of nuclear construction activities at Hartsville, the site was environmentally stabilized and placed in TVA's site inventory program. Based on preliminary in-house studies and investigations, the site has potential for the development of a range of alternative nuclear and fossil-fired generating facilities. At the present time, however, the site is being held in inventory and no decision regarding development for a future power generating facility has

been made. The Hartsville site is presently being used as a central distribution facility for TVA materials.

Question 6: Using TVA's own analysis, at what capacity factor must Watts Bar Unit 1 run so that TVA can at least break even on its investment?

Answer: Based on the capital cost to complete and operating costs over the life of the plant, Watts Bar Unit 1 will produce revenue to match costs if it operates at only a 35 percent capacity factor and revenue in excess of costs of \$2.2 billion at a 75 percent capacity factor.

Question 7: When TVA appeared before the Nuclear Regulatory Commission on January 26, 1994, Chairman Ivan Sellin questioned TVA's projected annual growth rate of 2.3 percent. Chairman Sellin stated that the projection did not seem likely taking into account conservation efforts, tougher clean air laws, and other factors that would reduce demand. Mr. Kingsley then acknowledged that the forecasts might be too high. Is TVA now re-evaluating the forecast?

Answer: Yes, TVA is in the process of completing a new load forecast, which will be reviewed as part of the IRP process. Because load growth is running ahead of the old forecast (load growth, adjusted for weather, was 3.1 percent from 1992 to 1993, and 3.9 percent so far from 1993 to 1994), the forecast through 2000 is likely to increase slightly.

Question 8: Interest rates appear to be going up. Higher interest rates will have an effect on the economy. Is the effect higher interest rates will have on the economy considered in your projected annual load forecast of 2.3 percent?

Answer: Yes, the forecast was based on a forecasted increase in interest rates from 1993 to 1994. For example, the prime rate was forecast to increase 1.1 percentage points and the 10-year bond rate was forecast to increase 0.5 percentage points. These interest rate forecasts were part of the national forecast provided to TVA by DRI/McGraw Hill.

Question 9: I understand the Nuclear Regulatory Commission (NRC) still has concerns that the documentation and plant records at Watts Bar are difficult to find. What is the status of the documentation at Watts Bar?

Answer: To address record issues at Watts Bar, TVA developed the Quality Assurance Records Project. During the implementation of this project TVA reviewed over 13,000 records. Through the efforts of this program,

approximately 250,000 previously missing records were located. In addition, approximately 300,000 existing records were cataloged to provide a more timely retrieval process. The completion of this project is expected on or about April 15, 1994. Results to date of many NRC inspections indicate that the completed records/documentation fully support licensing of Watts Bar Unit 1.

Since March 1993, the NRC has performed eight team inspections. The inspection teams have reviewed approximately 300 components and the associated records. NRC has expended over 3500 man-hours during these reviews. With the exception of one instance of missing records (TVA identified), the NRC has concluded that the pre-1989 records are retrievable and that TVA actions to resolve record discrepancies were adequate. The current status of NRC inspections is that the ninth inspection is 75 percent complete with no findings and the final inspection is scheduled to end in mid-May 1994.

With regard to contemporary records in support of new construction, startup, and operations, the NRC has reviewed these records numerous times and has identified only minor problems. These problems were associated with the timely retrieval of records prior to being cataloged in the record system. These problems have been fixed and the conclusion is that the records support the licensing of Watts Bar Unit 1.

Question 10: Why was diversity development moved during the TVA reorganization and deemphasized?

Answer: TVA's restructuring of its senior management team has strengthened diversity development. We have upgraded the position of Vice President of Diversity Development to that of Senior Vice President, Education, Training and Diversity. Dr. John B. Turner, who has been named to that position was formerly President of Knoxville College, a HBCU, and a Graduate School Dean at MIT, reports to the Board on diversity and has been assured of complete access. He is a member of our Operations Committee, which oversees every aspect of TVA's operations. Diversity issues will receive the highest level of attention.

Question 11: What percent of your contracts awarded were to Black-owned contractors?

Response: For fiscal year 1993, approximately 2.9% of TVA's contract dollars were awarded to minority contractors and of that 2.9%, 1.3% were Black-owned contractors.

QUESTIONS SUBMITTED BY MR. CRAMER

Question 1: Please describe to the Subcommittee the process TVA will employ to allow ratepayers to have more input in the TVA decisions and the process to be employed to allow TVA employees to have more input into TVA decisions.

Answer: We have designed a public participation process that incorporates input from the public in four ways. First, TVA will be collecting written comments on integrated resource planning throughout the initial scoping phase of our integrated resource planning process. Second, we will be conducting open house meetings throughout the Tennessee Valley during scoping. When the draft integrated resource plan is published, we will conduct another series of public meetings throughout the Valley to collect comments on the draft. Third, we will be interviewing approximately 100 people to collect their input on the issues that TVA faces as it develops its energy strategy. Finally, we are bringing together a review group of about 15 stakeholders to meet with us periodically as we develop the integrated resource plan. The group will provide input and review TVA's analyses assumptions and results.

In February, TVA published the first of several special reports on integrated resource planning in the employee newspaper Inside TVA. That special report included a reply coupon for our employees to provide input into our integrated resource planning process. Additionally, many TVA employees have been asked to serve as interdisciplinary teams to develop the building blocks of the integrated resource plan. As Energy Vision 2020 proceeds, we will be identifying other mechanisms for our employees to remain active in our integrated resource planning effort.

Question 2: Please describe any rate adjustments being implemented this year or proposed for FY 1995.

Answer: No rate adjustments are anticipated for 1994. TVA will be reviewing 1995 revenue and cost projections this summer but does not anticipate any rate adjustments in 1995.

Question 3: Can you update the subcommittee on the activities of the Inspector General?

Answer: Effective April 1, 1994, George T. Prosser became TVA's third Inspector General, replacing William L. Hinshaw, II. Prosser, who has been with the OIG since its inception, has served as the office's Assistant Inspector General for Investigations (AIGI) since March 1992. G. Donald Hickman, Manager of the office's Internal

Investigations department, has been selected to replace Prosser as AIGI. Hickman, who also has been with the OIG since its inception, has worked extensively with Nuclear Power to develop our investigative program regarding nuclear issues.

The OIG operates through three operational units--Audits, Inspections, and Investigations. The OIG's fiscal year 1994 budget is about \$8.7 million, and the OIG has approximately 120 employees. In addition to its operational units, the OIG has been supporting TVA's initiative to improve its contracting process through a Contract Improvement Team. The OIG also is improving its automation capabilities.

Significant OIG accomplishments since the last OIG semiannual report include the following.

As a result of OIG investigative efforts, the government has recovered more than \$1.2 million, and two individuals have been convicted for making false claims. More specifically, TVA recovered over \$600,000 when the OIG discovered a contractor salesman was defrauding the government. Similarly, OIG investigations of per diem fraud by contractor employees have led to one conviction, an order to pay \$45,000 in restitution, two indictments, and the Internal Revenue Service generating over \$500,000 in tax deficiencies. Other investigative results included (1) two convictions for making false statements to the Office of Workers' Compensation Programs and (2) a conviction under the Clean Water Act for throwing two bags containing potentially infectious medical wastes into Nickajack Lake.

Audit efforts during this reporting period led to the questioned costs of \$6,708,371, including \$670,110 in unsupported costs, and funds which could be put to better use totaling \$2,042,687. Audits which contributed to these amounts included (1) a preaward which found the contractor's costs were overstated by over \$1.3 million and (2) a review of a contract for software and related support services which identified significant internal control weaknesses, administrative problems, contract deficiencies, \$185,559 in questioned costs, and \$520,820 in funds which could be put to better use.

Other audit activities included (1) a finding that TVA's power forecasting methodology and results are reliable, (2) recommendations for improving TVA's Partnering in Performance contracts, and (3) recommendations for an integrated plan for moving to open computer systems.

Our inspections, considered collectively, identified opportunities where TVA could save between \$3 and \$5 million. Inspections included controls over the management of small tool inventories at TVA nuclear

plants, controls over the use of the TVA Business Credit Card Program and its impact on the procurement process, and prevention of billing errors from state agencies for payment of unemployment compensation.

The OIG will provide a copy of the OIG semiannual report for this period upon completion.

Question 4: Please provide to the Subcommittee the amount of funds TVA anticipates expending on the Bellefonte facility during the IRP process.

Answer: TVA currently plans expenditures on Bellefonte of approximately \$68 million (including corporate overheads) between October 1, 1993, and completion of the IRP.

Question 5: Please provide the subcommittee with a description of TVA's current, off-system sales or power exchanges and, in particular, a description of changes in the size, duration and scope of such power transactions over the course of the last three years. (See answer below.)

Question 6: Please provide the subcommittee with any internally or externally prepared reports, forecasts, memoranda, or other materials dealing with off-system sales or power exchanges with any current or future private or public customers outside the current TVA boundaries. (See answer below.)

Question 7: Please provide the subcommittee with a copy of all sales, purchase or interchange agreements between TVA and private or public utilities that are not TVA distributors. (See answer below.)

Answer: TVA's exchange power arrangements include all the types of transactions which normally take place between electric systems whereby each system seeks to minimize investment in electrical facilities, increase reliability of service, effect operating economies, and minimize the cost of electricity.

Exchange power arrangements enable TVA and other systems to better plan and utilize their facilities and operations to meet their responsibilities as power suppliers to their respective customers. TVA only enters into arrangements that benefit the TVA power system and thus the ratepayers of the region served by TVA. These exchange power arrangements normally establish the basic framework and general terms and conditions for individual transactions which the parties may enter into from time to time when it is mutually advantageous and economically feasible. Exchange power arrangements include making available capacity, energy, or both to the party. A common feature of such arrangements is settlement either by a return in

kind or by payment of an agreed-upon price, whichever is more advantageous to the parties. Under some types of exchange power arrangements, economy interchange in particular, transactions are on a split savings basis whereby the supplying party and the using party share in the savings achieved by the using party avoiding the use of electricity that would be more costly for it to generate than the generating costs being incurred by the supplying party.

Power exchange arrangements on an overall basis do not operate normally to make TVA either an exporter or an importer of energy. The exchange arrangements instead help to balance power supply and requirements and effect operating economies. The long lead time required to provide generating facilities requires forecasting the power requirements or loads for several years hence. If the load projections materialize and new generating resources come on stream as scheduled, the power supply and requirements should balance, thereby normally making the electric system neither a net exporter nor a net importer of energy.

TVA currently has various types of exchange power arrangements with a number of electric systems. Examples of such arrangements are: reciprocal emergency assistance; economy interchange; term energy seasonal diversity capacity exchange; short-term power and energy sales; and concurrent exchange.

The transactions between TVA and neighboring systems vary considerable by type, amount, and duration (hourly, daily, weekly, monthly, etc.)

For the last three years, amounts of exchange power between TVA and neighboring systems in billions of kWh were:

	<u>To TVA</u>	<u>From TVA</u>
FY 1991	3.8	1.1
FY 1992	2.3	4.5
FY 1993	7.8	8.5

Attached are copies of the basic exchange power agreements TVA has with neighboring electric systems including current service schedules.

Question 8:

Has it ever been TVA's intention to sell or lease Bellefonte? Is it TVA's intention now or within the next two years to consider selling or leasing Bellefonte? What would be the determining factors that would cause TVA to consider selling or leasing Bellefonte? What is the relationship between these factors and the IRP?

Answer: TVA is interested in a possible partnering relationship which would assist in financing the to-go costs of completing Bellefonte. It would be TVA's intention to maintain an interest in Bellefonte so that TVA could supply the least cost power to its customers. This effort is under investigation and no hard decisions or courses of action have been undertaken at this time.

Question 9: Because of the investment that Jackson County has made based on its understanding of TVA's commitment to Bellefonte, would TVA simply walk away from its relationship with Jackson County relative to economic development projects that arose out of Jackson County's belief that TVA would not sell or lease the Bellefonte facility?

Answer: TVA recognizes the investment Jackson County has made relative to its belief that Bellefonte would be completed. A partnering relationship would not detract from Bellefonte's contribution to Jackson County. If Bellefonte were completed under an alternative approach (other than TVA), the economic benefit to the community would be similar to the benefits received if TVA completed the units.

Question 10: Please provide the Subcommittee with an examination and overview of the Interruptible Power Programs and the steps TVA employs to insure a fair allocation of fixed (capital) costs are allocated to all customer classes.

Answer: Economy Surplus Power (ESP) and Limited Interruptible Power (LIP) are interruptible power arrangements available to industrial customers in the TVA service area. Participating industries agree to allow TVA to curtail the power's availability on specified notice; this allows the power to be priced below standard firm power rates, and helps TVA manage difficult power supply situations. During the 1994 ice storm, TVA was able to reduce peak requirements by 1,300 MW by interrupting ESP and LIP.

ESP also features real-time pricing, which allows participants to schedule their power usage at hourly rates to take advantage of low-cost generation during offpeak periods. Average costs are approximately 2 cents per kWh for ESP and 2.3 cents per kWh for LIP, compared to firm power costs in the 4 to 4.5 cent per kWh range. ESP costs can vary significantly, depending on actual hourly production costs.

These lower-priced power supply arrangements were developed in response to a significant decline in industrial sales following the early 1980s firm power rate increases. TVA's directly served industrial customers, in particular, are very electrically intensive and sensitive

to the price of electricity. Continued loss of industrial load would have put additional upward pressure on the rates of remaining customers to recover TVA's fixed costs.

In a cost-of-service study, TVA allocates fixed costs in proportion to each customer class's contribution to TVA's summer and winter peaks. However, ESP and LIP are not included in system peak projections for capacity planning purposes, helping hold down investments in new capacity. As a result, these loads are excluded from fixed cost allocation.

Question 11: Please identify all nonpower proceeds used to fund each of the Resource Group programs in FY 1992, FY 1993, FY 1994 and proposed for FY 1995.

Answer: The following table identifies the nonpower proceeds used to fund Resource Group programs for each of the indicated years:

<u>Description</u>	<u>FY1992</u>	<u>FY1993</u>	<u>FY1994</u>	<u>FY1995</u>
Recreation fees	477	527	550	600
Timber sales	1,468	1,779	885	835
LBL fees	2,011	2,004	1,665	2,965
Reclamation sales	999	1,775	2,127	2,127
Mineral rights payments	975	975	-	-
Licenses and leases	450	597	500	500
Fertilizer sales	693	-	-	-
Interest income	4,603	3,120	3,000	1,500
Asset sales	816	-	-	-
Other	<u>353</u>	<u>363</u>	<u>-</u>	<u>-</u>
Total nonpower	\$ 12,845	\$ 11,140	\$ 8,727	\$ 8,527

Question 12: TVA has published a document entitled "Energy Vision 2020, TVA Resource Planning Through the Year 2020." In that document, TVA announces plans to initiate a formal integrated resource planning process, which will include comparing the cost of completing nuclear units at Browns Ferry, Watts Bar and Bellefonte, with both other resource options (such as purchased power of building combustion turbines) and conservation programs. Will members of the public be invited to participate in TVA's Integrated Resource Plan? When does the TVA expect to finalize an integrated resource plan? What outside review or approval of the integrate resource plan is appropriate?

Answer: We have designed a public participation process that incorporates input from the public in four ways. First, TVA will be collecting written comments on integrated resource planning throughout the initial scoping phase of our integrated resource planning process. Second, we will be conducting open house meetings throughout the Tennessee

Valley during scoping. When the draft integrated resource plan is published, we will conduct another series of public meetings throughout the Valley to collect comments on the draft. Third, we will be interviewing approximately 100 people to collect their input on the issues that TVA faces as it develops its energy strategy. Finally, we are bringing together a review group of about 15 stakeholders to meet with us periodically as we develop the integrated resource plan. The group will provide input and review TVA's analyses assumptions and results.

TVA expects to finalize the plan by the end of 1995. TVA's Board of Directors will have the final approval of TVA's Integrated Resource Plan (IRP) after considering comments from reviewers.

Question 13: In 1979, Mr. David Freeman, then Chairman of the TVA Board of Directors, pledged to Congress that TVA will build only generation capacity necessary to match growth in electricity demand in TVA's service area, and that TVA would not attempt to supply electricity to cities or utilities outside its service area. Is that statement still true and accurate today?

Answer: Legislation enacted in 1959 limits the areas in which TVA can be source of power supply and we always intend to adhere to that legislation.

We operate our power system for the benefits of our customers, and we are working diligently to service them with reliable, competitively priced power.

We do not covet the customers of other utilities and do not have plans in place to bring them into our system.

We are concerned that competitors from outside the region are trying to take our customers away from our system. Under present restrictions we could not do the same.

If we do lose any customers, we will be back to see you about this situation.

Question 14: Does TVA have authority to market its power outside its service area, either by direct efforts or indirectly through third parties such as neighboring utilities or power marketers or power brokers?

Answer: As indicated above, the legislation enacted in 1959 limits the area in which TVA can be a source of power supply. However, the legislation further recognizes that TVA may continue to exchange power with neighboring electric systems with which TVA had exchange power arrangements on July 1, 1957. As permitted by that legislation, TVA has continued to do so.

Question 15: What steps, if any, does TVA take to ensure that legitimate recipients of its power do not resell or redeliver the power delivered to them by TVA? What steps, if any, does TVA take to prevent such resale or redelivery from taking place?

Answer: The 1959 self-financing amendment to the TVA Act describes limits on TVA's authority as far as being a source of power supply is concerned. We do not determine how others dispose of power obtained from TVA under exchange power agreements.

MR. CLEMENT. At this time I would like our second witness, Mr. Ellis Merschoff, to come forward. He is Director, Division of Reactor Projects, U.S. Nuclear Regulatory Commission, Region II.

Will you please stand and raise your right hand.

[Witness sworn.]

MR. CLEMENT. Your testimony will be accepted into the record as if read. If you want to summarize your statement, that will be fine.

TESTIMONY OF ELLIS W. MERSCHOFF, DIRECTOR, DIVISION OF REACTOR PROJECTS, U.S. NUCLEAR REGULATORY COMMISSION, REGION II, ATLANTA, GA

MR. MERSCHOFF. Mr. Chairman and members of the subcommittee, I am pleased to appear before you today to discuss the Tennessee Valley Authority's Nuclear Power Program. As stated in the introduction, I am the Director of Reactor Projects for the Southeast of the U.S. Nuclear Regulatory Commission, and this includes responsibility for regulatory oversight of the TVA nuclear facilities in operation and under construction.

Appended as attachments to my testimony are details of the Nuclear Regulatory Commission's responsibility and authorities over TVA as well as the details of the history of the TVA nuclear program from a regulatory perspective.

Moving ahead to operating units, to save time, I will begin with the restart following the 1985 shutdown. The Sequoyah units were restarted in 1988 and subsequent safety performance of those units was assessed as good. Generation performance in terms of electrical production for Sequoyah was high through much of that period. NRC SALP reports assess performance as good but a declining trend became perceptible at the Sequoyah site in 1992.

In late 1992, a pattern of events developed with regard to poor plant performance and staff personnel errors. This sequence of equipment failures and personnel errors culminated in extraction steam line rupture in March 1993. A review of the causes of this event revealed weak management, a failure to maintain balance of plant equipment, and fragmented organizational interfaces.

TVA voluntarily shut down both units in March 1993 and performed extensive recovery actions prior to restarting one unit in the late fall of 1993. The other unit is scheduled to be restarted this month.

Following the recovery of the Sequoyah units in 1993, management attention and resources were focused on the recovery of the Browns Ferry unit 2 which was restarted in the spring of 1991. Browns Ferry unit 2 has performed very well. NRC SALP reports have awarded Browns Ferry unit 2 superior ratings in several categories of safety operations. The unit has also performed well from an electrical generation standpoint. Browns Ferry unit 2 recovery and operations have been characterized by stable and capable management, conservative operations, and an overall good safety attitude.

Browns Ferry units 3 and 1 are both shut down and in a recovery mode. Priority attention is currently placed on unit 3 which is being upgraded to the same standards and procedures as unit 2. The recovery of unit 3 has been hampered by the inability to meet schedules and plans. This has been exacerbated by a major change

in TVA philosophy with regard to design and construction of power plants.

In the early 1990s, TVA decided as an economic measure to contract out design and construction of plants with TVA providing an oversight and management role while the core group of TVA engineering personnel supplemented by contractors continued to support plant operations. Browns Ferry unit 3 was involved in this transition and the ensuing difficulty in managing multiple contractors contributed to delays in work progress on Browns Ferry unit 3. Changes made to TVA project management practices and management organization approximately one year ago have resulted in good progress in the most recent timeframe. Productivity has increased and the quality of work is in general compliance with regulatory requirements.

TVA has NRC construction permits for four nuclear power reactor units. Two of these are at the Watts Bar site and two are located at the Bellefonte site.

Following the withdrawal of the certification that Watts Bar was ready for licensing in 1986, TVA continued to work towards completion of the construction and licensing process for Watts Bar until December 1990 when TVA voluntarily stopped physical construction work due to work control problems. During the work stoppage, TVA hired a contractor to perform all future construction and modification work and significantly upgraded the work control process and reduced its backlog of items necessary to support construction work. All systems were transferred back to the engineering and modifications organization and a decision was made to again perform the entire pre-operational testing program before certifying that Watts Bar unit 1 is ready to load fuel.

The NRC conducted a SALP assessment of Watts Bar performance for the period June 1992 to June 1993. This was the first SALP assessment for Watts Bar since 1985. The SALP evaluated the overall performance of the Watts Bar facility as good. However, the NRC expressed concern about the marginal effectiveness of the quality assurance functions which contributed to a low rating in the area of safety assessment and quality verification.

In the eight months since the end of the last SALP period, significant changes have been made in the quality assurance area which have resulted in improved performance of the quality assurance function. At present, TVA is conducting the pre-operational test program which assures that important components and systems function as intended. The quality of the test procedures and test performance has been acceptable. Progress is being made in the pre-operational testing program with completion of a major milestone, hot functional testing, expected in the spring of this year.

The Bellefonte units received construction permits from the NRC in the 1970s and construction of the plants proceeded until TVA stopped construction of unit 2 in 1985 and unit 1 in 1986 because of decreased load demand. In accordance with NRC's 1987 policy statement on deferred plants, TVA notified NRC of the deferred status of Bellefonte units in 1988. Unit 1 was over 90 percent complete and unit 2 was approximately 50 percent complete, and both

units were placed in extended lay-up to preserve the equipment and materials.

In March 1993, TVA notified NRC of its plans to resume design and construction activities on a limited basis. Following the NRC's determination that equipment preservation and maintenance programs were properly performed and that TVA's knowledge of the condition of structures, systems, and components was adequate, limited completion activities were resumed.

TVA currently plans to complete all construction and pre-licensing testing activities for Watts Bar unit 1 in time to support licensing and initial fuel load by the fall of this year. This Watts Bar plan is a very aggressive schedule predicated on an efficiently run pre-operational test program to demonstrate the quality of systems and readiness for operation. Progress is being made towards licensing. But based on TVA's past performance and the likelihood of schedule-impacting test deficiencies which commonly occur in a pre-operational test program, some schedule slippage seems likely.

The recovery efforts for Browns Ferry unit 3 are scheduled to be completed in time to support fuel load in June 1995 and power operation in September 1995. Using plans similar to those employed and proven during the unit 2 recovery, the engineering work is essentially complete and the modifications work is progressing. At this point, the recovery plans for unit 3 at Browns Ferry appear to be achievable.

TVA, as you know, intends to develop the plans and schedules for the remaining projects as part of an Integrated Resource Plan.

Mr. Chairman, this concludes a summary of my statement. I would be pleased to answer any questions that you or the subcommittee members may have.

Mr. CLEMENT. Thank you, Mr. Merschoff. One of the key questions for this committee in assessing TVA's financial situation is determining what capacity factor they are likely to achieve in operating their nuclear plants. You may have heard Mr. Borski ask Chairman Crowell for a sensitivity analysis assessing how TVA's financial projections would be affected by adverse experience with capacity factors at their nuclear plants. A sensitivity analysis, of course, requires the assessing the impact of achieving the highest capacity factor that can reasonably be anticipated as well as assessing the impact of the lowest capacity factor that could be reasonably anticipated.

Based on your experience with TVA's nuclear power program as well as the nuclear programs of other utilities, what should TVA consider as part of a prudent sensitivity analysis to be the lowest capacity factor that can reasonably be anticipated?

Mr. MERSCHOFF. Mr. Chairman, that's a difficult question to answer. When a plant is completed and tested, it is not licensed until the tests show that the plant is properly designed, constructed, and can be operated safely. The expectation with that is that it can run in the expected periods of time and provide the anticipated availability factor.

A look at the history of TVA plants and other plants in the first year of operation typically show a learning curve where some problems develop and as the plant matures the power generated factors increase. I don't have at this time an answer to your question but

could provide the experienced capacity factors for recently licensed plants in their first and second year of operations.

Mr. CLEMENT. That would be very helpful if you could supply us with that information.

[The following information was received for the record:]

New Plant Capacity Factor Data

		Average Capacity Factor (Maximum Dependable Capacity - Net)		
		First 12 Months	Second 12 Months	First 24 Months
New Plants	Maximum	96.6	85.3	80.8
	Minimum	57.5	10.0	50.8
	Median	77.7	65.0	68.2
Browns Ferry 2		86.6	54.6	70.6
Sequoyah 1		88.9	52.3	70.6
Sequoyah 2		46.9	89.1	68.0

Data Source: Monthly Operating Reports submitted per Regulatory Guide 1.16 and plant Technical Specifications.

Notes:

- (1) New plant average based on 12 units which began commercial operation after 1987.
- (2) One of the new plants has not yet entered its second year of commercial operations so its data are included only for the first 12 months of operation.
- (3) Browns Ferry 2 data for its 1991 restart from an extended shutdown.
- (4) Sequoyah 1 and 2 data for their 1988 restarts from an extended shutdown.

Mr. CLEMENT. In your testimony, you say there probably will be slippage of the TVA work schedule at Watts Bar 1. In your opinion, when will unit 1 be ready for licensing and fuel loading?

Mr. MERSCHOFF. Mr. Chairman, understanding, as you do, at the outset that our job is not predicting schedules, it is rather assuring that whenever that plant is finished it is designed and constructed properly and safely. So my comments on the schedule slippage are more from an experiential base, and that is while we see no clear obstacles in the way to Watts Bar's current advertised schedule, it is nonetheless aggressive. Typically, problems occur in pre-operational testing—pumps break, errors are made—requiring some minor redesigns, modifications, or simply getting those components repaired. It would be my anticipation that these potential slippages are in terms of weeks and months as opposed to years. But I have no sound basis other than experience and gut feel to provide that to you.

Mr. CLEMENT. Mr. Merschoff, there is a feeling on behalf of some that there has been almost a conspiracy on behalf of the Nuclear Regulatory Commission not to license any nuclear plants. I know back several years ago with all the retrofitting and all the modifications and changes, you spent more on retrofitting and modifications than you did for what the plant was supposed to have cost originally. Why?

Mr. MERSCHOFF. If the question regards the modifications made and ordered after Three Mile Island in 1980, I would like to submit an answer to the subcommittee on that after careful thought and sound justification as opposed to just off the top of my head, sir.

Mr. CLEMENT. Because I am the one that sponsored the legislation on the House side, after serving on the TVA board and knowing all the problems that we experienced during that period of time from 1979 to 1981, on nuclear standardization and licensing reform which we needed years past rather than now to save the nuclear option for the future.

Mr. MERSCHOFF. Following Three Mile Island there were a large number of changes and enhancements that were mandated. Those changes have largely been made and a number of plants have been licensed since that time. So I would have to disagree with any implication that there is a conspiracy not to license. Certainly there was work that needed to be done prior to licensing.

Mr. CLEMENT. But you don't know of any other utility that is building nuclear plants at present?

Mr. MERSCHOFF. Well, some have recently been completed and licensed. The Comanche Peak plant.

Mr. CLEMENT. But we don't have any that are being constructed at the present time other than TVA's.

Mr. MERSCHOFF. Yes, sir. At this time, 100 percent of the construction projects for civilian nuclear power in this country are the TVA four units under construction.

Mr. CLEMENT. How have TVA's nuclear operations compared with other nuclear utilities in the Southeast region?

Mr. MERSCHOFF. In 1985, they were obviously the worst. Subsequent to 1985, as discussed in the testimony, a substantial number of changes and improvements in both the management and the hardware at the facilities have resulted in much improved oper-

ations at the Browns Ferry and the Sequoyah sites such that now the Browns Ferry site is operating quite successfully. The Sequoyah site had been operating successfully up until 1992, experienced a number of difficulties, TVA voluntarily shut both units down, took seven to eight months of significant material enhancements prior to restarting unit 2, and unit 1 remains down undergoing the same level of enhancement prior to restart.

Mr. CLEMENT. How would you rate TVA's nuclear program over the past two decades? I guess you have already said it was somewhat abysmal back in those early days, but what about now?

Mr. MERSCHOFF. As far as their nuclear program right now, it is seeing some success. In terms of Browns Ferry unit 2, from its restart in 1991 it has operated very successfully. It has good, sound management, a good safety culture in place, and is among the better of the plants within the Southeast.

Mr. CLEMENT. Has TVA experienced more forced outages of its nuclear units than other nuclear utilities in the Southeast region?

Mr. MERSCHOFF. That depends of course on the timeframe chosen. If you talk contemporary times, subsequent to the restart from the 1985 problem, that is certainly not the case for Browns Ferry. In terms of Sequoyah, it probably is higher in terms of forced outages.

Mr. CLEMENT. Okay. Mr. Cramer.

Mr. CRAMER. Thank you, Mr. Chairman. I want to continue along, if you would please, on Browns Ferry. You made reference to unit 2 at Browns Ferry that has performed exceptionally well.

Mr. MERSCHOFF. Very well, yes, sir.

Mr. CRAMER. In your comments in your written statement about unit 3, "The recovery of unit 3 has been hampered by the inability to meet schedules and plans." Could you elaborate on that.

Mr. MERSCHOFF. Yes, sir. Since the recovery of unit 2 in 1991, the effort to recover unit 3 has been fragmented. It lacked sound leadership and direction. In addition, around that timeframe is when TVA chose to change the way they do business from being their own architect/engineer/designer/constructor to contracting. Of course there is nothing wrong with that change, but it is change and change is difficult to manage. That change caused the process further difficulties in getting it on track and scheduled.

Mr. CRAMER. And so the problems with unit 3 then could be attributable to that change, the contracting out issue?

Mr. MERSCHOFF. Only partially. There were problems in management and leadership of that project as well.

Mr. CRAMER. And you made reference on down in your statement though about the contracting out issue. Toward the end of that paragraph, "Productivity has increased and quality of work is in general compliance with regulatory requirements." How do you know that productivity has increased?

Mr. MERSCHOFF. We have resident inspectors on the site. I have four engineers who live and work in that area and report to that plant every day. Additionally, we meet with TVA managers to obtain status on the work. And it is clear that a change has occurred in terms of the leadership and the progress being made.

Mr. CRAMER. Back to the Chairman's point and your reference that from around 1985 there were abysmal management problems

but things have gotten better with regard to certain units, anyway. Taking Browns Ferry units 1, 2, and 3, are there any lessons to be learned from the work on those three units that you could summarize quickly for us?

Mr. MERSCHOFF. Certainly. I think one of the problems with Browns Ferry is that it was generating power and bringing in revenues, and the requisite amount of investment in that machine in terms of maintenance and design enhancements were not being invested. Ultimately, in 1985, that culminated in sufficient problems that the plants needed to be shut down for an extended period of time for the hardware improvements and the people improvements to be made.

Mr. CRAMER. Could I get you then to shift to the IRP. You made reference to that at the end of your statement. TVA intends to develop plans and schedules for the remaining projects, Watts Bar 1, Brown's Ferry 1, Bellefonte 1 and 2, as part of the IRP. You were in here when we were questioning TVA about the whole process. Would you make any comment on that, or would you see your having any role in that?

Mr. MERSCHOFF. No, sir. I view the IRP as a business plan for TVA, and as the regulatory authority, I really don't have a role in that. Whenever they choose to bring those plants on line, if they choose to bring them on line, I will assure that if licensed, they are properly designed, constructed, and tested. But I don't really have a role in their business plan.

Mr. CRAMER. Have you been involved in a process like this with other utilities?

Mr. MERSCHOFF. Certainly other utilities have business plans, and we are briefed on those business plans; as we will be and have been on the IRP, but we have not had a role in determining them.

Mr. CRAMER. Thank you, Mr. Chairman.

Mr. CLEMENT. Thank you, Mr. Merschoff, for your testimony today. We will be finished with you, unless you have any final statement to make for the record.

Mr. MERSCHOFF. No, sir, I very much enjoyed the opportunity to appear here today.

Mr. CLEMENT. Thank you.

We are going to stand in recess until 1:15 p.m., and we will back here. Thank you.

AFTERNOON SESSION—1:15 P.M.

Mr. CLEMENT. We would like to welcome our third panel this morning, if you will please come forward.

Mr. Sam Head, Jr., General Manager of Columbus, Mississippi Light and Water on behalf of the Tennessee Valley Public Power Association; Mr. Tim Soles, Chairman of the Executive Committee on behalf of the Tennessee Valley Industrial Committee and Associated Valley Industries; Dr. Matthew C. Cordaro, President and Chief Executive Officer, Nashville Electric Service; Mr. Allan Pulsipher, Director of Policy Analysis, Center for Energy Studies, Louisiana State University.

If you will, raise right hands.

Do you solemnly swear that the testimony you will give before the subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

[Panel answers affirmatively.]

Mr. CLEMENT. Be seated.

Mr. Head, we will start with you.

TESTIMONY OF SAM A. HEAD, JR., GENERAL MANAGER OF COLUMBUS, MS, LIGHT & WATER, ON BEHALF OF THE TENNESSEE VALLEY PUBLIC POWER ASSOCIATION; TIM SOLES, CHAIRMAN OF THE EXECUTIVE COMMITTEE, ON BEHALF OF THE TENNESSEE VALLEY INDUSTRIAL COMMITTEE AND ASSOCIATED VALLEY INDUSTRIES; MATTHEW C. CORDARO, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NASHVILLE ELECTRIC SERVICE; AND ALLAN PULSIPHER, DIRECTOR OF POLICY ANALYSIS, CENTER FOR ENERGY STUDIES, LOUISIANA

Mr. HEAD. Thank you, sir. I'll try to move over the top, rather than cover all of it.

Mr. Chairman, and members of the committee, my name is Sam Head. I am a resident of Columbus, Mississippi, where I serve as General Manager of the City of Columbus Light and Water, a municipally owned electric system, which purchases its power at wholesale from the Tennessee Valley Authority.

Today I am here in my capacity as chairman of the Power Supply Planning Committee of the Tennessee Public Power Association. TVPPA is a regional service organization, representing 160 electric systems that sell power to the residential, commercial and industrial customers in the Tennessee Valley. All of these 160 distributors buy their power from TVA.

We appreciate the opportunity to appear before this committee, for we all have significant interest in TVA's present operations, and in its future. Through various mechanisms, Valley consumers have a role in choosing governing boards of all of the 160 utilities which distribute TVA power. We are principally involved in TVA's power program, which is supported entirely by revenues from the sale of electricity.

TVPPA members, individually and collectively, negotiate on a regular basis with TVA on matters of rate structure, and other aspects of TVA. This is an effective method, we think, of assuring citizen input into TVA operations. Because of our obligation to serve the interests of all of our citizens, we have no agenda targeted to any special interest. Our obligation to serve those citizens is one that runs to all of them, residential, commercial, industrial; all races, all colors, everybody in all walks of life in the Valley.

For these and other reasons, we are vitally interested in TVA's long term goals and plans. TVA and TVPPA members work together on numerous matters other than the power program, particularly in the areas of economic development. These close relations between us put us in a somewhat difficult position at this time. On the one hand, we are strong TVA supporters in both its power and non-power programs. However, we have obligations to the citizens we serve to see that they have source of reliable electric power at the lowest possible cost.

It is only in recent years that the potential for conflict between these obligations have caused the relationship we have with TVA to be examined with greater care. Years ago there was no source of power in the Southeast area available at a cost comparable to TVA's. Even though TVA has maintained rates at a constant level since 1988, and the cost of TVA power is certainly more competitive today than it was in 1988, there are now other sources of power that might be available to some TVPPA members.

With open access to transmission now available throughout the United States, and with the mandates of the Energy Policy Act of 1992, TVPPA members now must analyze other possible sources of power. We now must take an active and vigorous role in analyzing TVA's nuclear program, which requires an assessment of TVA's load forecasting procedures, that we have heard today.

When one speaks of TVA's increasing debt burden, one must consider will have to be serviced for the most part by the distributors, the 160, in the Valley. Our rate payers have to pay this. The destinies of TVA and the TVPPA members are so intertwined that we cannot and will not ignore either the internal or external factors that bear upon TVA's ability to compete with the other electric utilities that surround the TVA region.

We are philosophically in agreement with the purposes of the TVA Act, and do our part by distributing electric power locally on a non-profit basis to the consumers. However, because of the contractual relationship between TVA and us, we and the citizens we serve have a heavy substantial financial interest in TVA's future. If TVA makes a mistake, we pay the bill, which be passed through us to the citizens that we serve.

One hundred and fifty-five TVPPA members have signed sole-source-of-supply power contracts with TVA, which means that we must purchase all of our power from TVA. They provide for a cancellation upon 10-years notice. Of the remaining five, as was mentioned here today, Bristol, Virginia and one other rural electric cooperative that is in Mississippi, have already approached TVA and put them on notice of the possibility of not renewing their contract. Our understanding is that Bristol has now agreed and signed a contract with TVA, perhaps on a shorter period, and the rural electric cooperative has some 10 years in which to make a decision what direction it is going to go.

This action may be symptomatic of a concern many of us have as to whether or in what manner there should be a continuing relationship with TVA. The primary basis for that concern appears to be whether TVA can be a competitive producer of electric power. TVPPA power supply's planning committee was formed after the passage of the 1992 Energy Act.

This planning committee will conduct studies and analyze the alternatives available to TVA and TVPPA members for sources of power. The least-cost planning process mandated for TVA and TVPPA members under the Energy Policy Act of 1992, is indeed an appropriate mechanism for examining how TVA will meet its near term and long term obligations.

TVA has informed us that a citizens review group will be formed to advise TVA as it develops its integrated resource plan. We understand that review group will be broadly representative of TVA

representatives, and will include some TVPPA members. That process, we believe, will be a healthy exercise, and we hope that it will help provide the best information to the TVA board.

However, the IRP process is so important in charting TVA's future, and in determining TVA's competitiveness, that our involvement in the IRP process will not be limited to its participation in the review group. Section 113 of the Energy Act of 1992 defines a very active and specific role for TVPPA members in connection with the IRP. We intend to fulfill that role.

We know that you are concerned with the construction of TVA's nuclear power program. So are we. We know that you are concerned with the process TVA will use in its integrated resource planning process. So are we. We know that you are concerned about the \$30 billion dollar debt limitation placed upon TVA, and whether that will be sufficient for future needs. And so are we.

These are precisely the reasons TVPPA named 28 managers from our members to serve on the power supply planning committee and closely analyze these issues and make our position known to TVA. One thing that I wish to emphasize today is that as a part of this subcommittee's consideration, we must be cognizant of not only the need of an economical and safe source of electric power, but we need to be sure that there is an adequate and a reliable source of power.

In the early days of TVA, the citizens of the region were simply happy just to get electric power. But that is not the case today. Our businesses, our whole lifestyle is totally dependent upon the electric industry. People are used to service they can rely on. We must keep that in front of us.

During the recent ice storm—this was touched on a little bit today—we heard citizens groups; we know that the Tennessee General Assembly adopted a resolution to schedule hearings because of the long outages—there is no reason to believe that a lack of supply of reliable power would not cause the same kind of protest. We cannot get in that shape. Perhaps protests even of a greater magnitude than what we have seen across the Valley in the last month or so.

It is not just the recent ice storm that I am concerned about. In January, I was threatened with—and so were the rest of the 160 distributors—with the possibility of rotating blackouts. TVA's power supply was seriously threatened during the January 18 or 19 period, when it was so cold. That doesn't sound like we had an adequate power supply, if we are having to tell our customers that we are running the risk of rotating blackouts so that we can keep the system together.

I have heard earlier here today that we had 20 percent more power supply than we needed. I would have to seriously question that. If we have another period this winter, or next winter, that is comparable to the one we had this year, I think you will see that we do not have any surplus power supply.

Business interruptions and other inefficiencies and inconveniences caused by lack of an adequate power supply are counter-productive to the long term economic interest of the United States, not just to the TVA region.

As the power supply committee embarks upon its mission, we will be seeking wise and balanced decisions from TVA, and we will offer our views to its management and board. At this time, we do not have answers on the issues that you have under consideration. It is a complex equation. It will take a lot of time, effort, and detailed analysis. Then it will simply come down to wisdom and good judgement of the TVA board.

It would seem on first blush that completion of one or more of TVA's nuclear plants, TVA's debt limitation, and the integrated resource planning are all bound together. If future capacity is required in the TVA region, and the best alternative from the standpoint of economics, reliability, and safety, is completion of one or more of TVA's nuclear power plants, then funds will have to be made available to implement that.

The December 1993 TVA Bond Offering Document states that there is about \$25 billion in TVA indebtedness outstanding. We at TVPPA are anxious to explore with TVA the feasibility of meeting the future power supply demands of the TVA region within the scope of its borrowing capability and authority. We are also committed as an association to aid and offer our assistance to TVA for its consideration as its directors make these important decisions. The TVA Act mandates that electric power be made to the citizens of the TVA region at the lowest possible costs.

TVA is not in the business of making a profit. It exists to serve both the national interest and the interest of the citizens of the TVA region. There is no reason to believe that TVA would make a decision of future power supply other than in good faith based on the best information available to its directors at the time of their decision. We are vitally interested in how TVA conducts its operations over the next years, as practically all of us have signed wholesale power contracts on a long term basis to have TVA supply all our wholesale electric power requirements. We are anxious to do our part to help in any way we are able as TVA conducts its decision making process.

Mr. Chairman and members of the committee, I thank you for the opportunity to express my views to you today.

Mr. CLEMENT. Thank you very much, Mr. Head.

Mr. Soles.

Mr. SOLES. Thank you, Mr. Chairman.

My name is Tim Soles. My appearance today is on behalf of Industrial Electric Customers of TVA throughout the TVA service area. The industrial organizations I represent were formed specifically for the purpose of working with TVA and their distributors on assuring a reliable, efficient electric energy supply at the lowest possible cost, consistent with meeting various environmental requirements.

The Tennessee Valley Industrial Committee and Associated Valley Industries are the direct-served and distributor-served industrial customers in the TVA service area, respectively. Together TVIC and AVI include more than 90 separate industrial, and upwards of 100,000 jobs at more than 150 manufacturing and operations locations in the Tennessee Valley. To give you a further idea of the scope of our combined operations, my estimate is that these

companies together purchase upwards of 20 percent of TVA's electric power output.

For the last several years, and currently, I would describe our working relationship with TVA at both the staff and board levels as very good. We believe TVA shares our interest in competitive electric rates for the job producing sectoring of the economy. We work very hard together on this issue. As you might expect we don't always reach the same conclusions, but we believe a good faith effort at a utility-customer partnership is being made on both sides.

Any discussion of TVA's nuclear program needs to have a bit of historic perspective. I am not going to cover the rise and fall of nuclear power in the United States. However, it should be pointed out that TVA, with TVIC and AVI's urging and full support, took the difficult but necessary action of canceling almost half their nuclear plant construction. Four reactors were canceled in 1981. Another four were scrubbed in 1984. The remainder, which were not yet licensed for operation, were put on a stretched out completion schedule.

Industrial customers have no reason to quarrel with TVA's current load forecast over the ten year planning horizon. It seems reasonable to us, based on our own companies' projections of what individual plants will be doing during that time period, and seems to assume only modest economic growth; certainly not extraordinary growth.

TVA service area industries have not gone on record as either proponents or opponents of nuclear power. We would like to think that the continued construction of TVA's nuclear plants nearing operational readiness would salvage some of the billions of ratepayer dollars already invested in these units. But we, like others, do not know if this is a certainty.

We believe the integrated resource planning process will permit a more accurate estimate of the cost effectiveness of completing and operating these units. Until the integrated resource planning process either validates or invalidates this cost effectiveness, no prudent person would rule out the nuclear option.

I would like to assure this subcommittee that Tennessee Valley Industry will cooperate fully in providing our own usage projections and information to TVA, as well as an independent economic analysis of TVA's proposed resource addition program.

Opponents of nuclear power have asserted that perhaps additional conservation in both the residential and industrial sectors would eliminate the need for completing the TVA nuclear plants under construction. Industrial consumers have always supported cost effective conservation measures, but cannot support social programs promulgated under the guise of conservation that increase electricity rates.

In the extremely competitive environment our industries face, and in view of the current cost of electricity itself, I would like to assure the subcommittee that the manufacturing sector, as represented by our organizations, has made substantial contributions to the conservation effort. For example, the chemical industry reduced energy consumed per unit of output by over 32 percent be-

tween 1974 and 1990, as measured by the Federal Reserve Board Index of industrial production.

This leads into a brief discussion of current and future rate levels, and the importance to us of TVA improving its competitiveness with respect to industrial electric rates. We believe keeping existing jobs and bringing new jobs to the Valley are important to TVA. We support TVA's efforts to be more competitive with other utilities, and to supply electric power at the lowest practical cost.

Currently TVA has one of the lowest system average electric rates in the southeastern United States. For example, residential rates average about 5.5 cents per kilowatt hour, as opposed to 9 cents per kilowatt hour in Houston, Texas, where I am located. I believe in the Washington, D.C. area, they might be upwards of 10 cents per kilowatt hour.

On the other hand, TVA firm industrial rates do need to be more competitive. I know the TVA board is aware of this, and is considering ways to achieve more competitive industrial rates within their goal of not increasing any customer classes' rates.

I would like to turn now to the issue of TVA's debt, and address what the subcommittee has referred to in its communications with us as TVA's increasing debt burden. I'd like to put that so-called burden in some perspective. First, we hope that members of the subcommittee will share our view that debt, in and of itself, is not necessarily bad. For one thing, it can be a very important reflection of growth. If the business is growing, a proportional growth in debt is acceptable.

In our view, TVA should focus, and we believe it is, on a number of areas.

Mr. CLEMENT. Mr. Soles, why don't you hold up there? I've only got five minutes left to vote. We will take a ten minute recess, and then we will start again.

[Recess.]

Mr. CLEMENT. We are back on the record. Mr. Soles.

Mr. SOLES. Thank you.

I was in the process of discussing TVA's debt burden, and I was at the point where I said that growth in debt, for one thing, can be a very important reflection of growth.

If the business is growing a proportional growth in debt is acceptable. In our view, TVA should focus—and we believe it is—on a number of areas besides just the total debt figure.

The first focus should be on debt service to assure that it is at an affordable level. Second, electricity sales should be continuing to increase through competitive pricing. Thirdly, expenses should be under control.

We believe TVA's performance is very acceptable using these criteria. In the interest of time, I will provide only a spot check example of how TVA has been meeting these criteria.

As has been mentioned, about one-third of every revenue dollar TVA took in goes to interest payments. That ratio has remained consistent over the past three years. In fact, it has declined somewhat.

As Congressman Duncan mentioned, TVA continues to have significant retained earnings. Hence, the interest is not necessarily a bad thing, as long as the other criteria I mentioned are met.

What about the growth in interest expense as it relates to revenues? Interest expense from Fiscal Year 1992 to Fiscal Year 1993 grew by about three and one-half percent, while revenue growth was greater over the same period—about 4.2 percent. This means that TVA was more than covering the increase in interest expense through greater sales.

How about expense control? Comparing those same two years, TVA's operating expense increased by 2.2 percent, from Fiscal Year 1992 to 1993, about one-half the revenue growth rate. So that would appear to be in good shape also.

Certainly the level of TVA debt, and how it is managed should be watched, particularly if predicted growth should fail to materialize. But we are not overly concerned at this point at either the overall amount of TVA debt when compared to its earning power, or the level of its interest payments when compared to its revenues and operating expenses.

The subcommittee also requested our views on how TVA is doing on integrated resource planning. As the subcommittee members know, this is a federally mandated process under which TVA, and all other utilities, are examining their options for meeting future power needs, and hopefully arriving at the least-cost options when all pertinent factors are taken into account.

As representatives of a large segment of TVA's customers and a large segment of its power usage, we have been involved very closely with TVA in its IRP process planning for more than a year. We anticipate continuing to take an active role as the process itself begins. TVIC and AVI will be represented on TVA's review group for the IRP process.

I have mentioned that electric rates are critical to our manufacturing operations. I also have mentioned that TVA least-cost options to meet future power demands are equally critical to our future growth and viability. So, you may rest assured that we will do all we can to assure that an objective determination of the best future options for TVA and its customers is, in fact, made. Thus far, we believe TVA has handled the process appropriately.

I will close by saying we have been pleased by the way Chairman Crowell, and his fellow directors, Bill Kennoy and Johnny Hayes, have continued to be strong supporters of industry and the concept of competitive electric rates. This is one of the principal goals the board has adopted early on, and we believe it a highly appropriate goal.

The board is further to be commended for its confirmation of that goal by committing to not raising additional revenue through rate increases for a period of four years. At the same time, we will be continuing to talk with the TVA board about the need to improve its competitive position on industrial rates. Our industries face extremely vigorous competition from abroad, from within the United States, and from other plants within our companies. So, this has to be a priority for us.

Thank you very much for your attention to my statement. I will try to answer any questions you may have.

Mr. CLEMENT. Thank you, Mr. Soles.

Dr. Cordaro, it is a pleasure to have you in Nashville, Tennessee, since you are a relative newcomer.

Mr. CORDARO. It is a pleasure to be here. Good afternoon, Mr. Chairman, and thank you for having me here.

My name is Matthew C. Cordaro, and I am the President and Chief Executive Officer of the Nashville Electric Service. Prior to joining NES in June of 1993, I was President of Long Lake Cogeneration Corporation, an independent power company. Before that, I was with the Long Island Lighting Company, a private investor-owned utility, for 22 years, where my last position was Senior Vice President of Operations, Engineering and Construction.

By way of background, and to give you a further perspective on the bias of my remarks, or perhaps the lack of bias in my remarks, is the fact that my education includes a bachelor's degree in engineering science, a master's degree in nuclear engineering, and Ph.D. in the nuclear field. I have also been an atomic energy fellow, a guest research associate at the Brookhaven National Laboratory, and on the adjunct engineering nuclear faculty of a university.

Nashville Electric Service was established in 1939 when the city of Nashville purchased the property of the Tennessee Electric Power Company. NES is owned by the Metropolitan Government and operated by a five member board appointed by the mayor and confirmed by the Metropolitan County Council.

NES does not own or operate any generating capacity, and is one of TVA's largest distributors. In terms of number of customers served, we are the ninth largest public electric utility in the United States. We are just under 1,000 employees, serving approximately 280,000 customers. Thirty-one thousand of those are commercial accounts.

I want to open by stating that none of my comments today should be taken as criticism of the current management at TVA. In fact, I think quite highly of the new board and strongly support the recently announced reorganization that segregates nuclear functions from other aspects of TVA's operations.

The new structure is very similar to that employed by some very successful private utilities who have found that such a separation is essential. Without it, the demands of operating nuclear power plants can drain resources, and overshadow the absolute necessity of a clear focus on customer issues. I commend Chairman Crowell, and the rest of the TVA board, for recognizing this, and acting promptly to implement the changes.

I also recognize and am grateful for their heightened sensitivity to the business issues that we are all facing. I also want to make it clear that I am not here to play Monday morning quarterback, and criticize past administrations.

Changes in the economic and political climate do not invalidate decisions that were prudent for the conditions that existed at the time they were made. TVA has served the Tennessee Valley and the United States well for some time, and has provided economic and societal benefits far beyond original expectations.

But we cannot live in the past. The future we face today is at least as challenging if not more difficult. There is also enormous opportunity in the future if we combine the advantages of public power with the best attributes of private industry.

Like the most successful private companies, we the public utilities must develop well thought out competitive strategies, cultivate a sense of urgency and tension, implement better management systems, become innovative, and above all be willing to take measured risks. To accomplish this however, we will need an equivalent level of flexibility and forward thinking from our supplier of bulk power in the Tennessee Valley, TVA.

Having spent nearly 30 years in various aspects of the energy business, I feel that I know the risks involved in pursuing an extensive nuclear power program. I have also lived through one of the most tragic episodes of the nuclear era, the construction, licensing, and death of a major nuclear power station.

When I talk about nuclear risks, I want to make it perfectly clear that it is business risk, not health and safety, that I am referring to. I remain strongly convinced that nuclear power is a safe and environmentally compatible method of generating electrical energy. In fact, nuclear generated electricity may play an essential role in meeting the requirements of the Clean Air Act amendments.

But having said that, I must add that the current political and social obstacles that exist may make the cost of additional nuclear power plants unacceptable in an era when we must learn to be competitive. In fact, I believe there must be serious debate about the construction of any large centralized power generation. I urge TVA to carefully balance its ambitious nuclear program against the potential benefits of meeting future needs for power through dispersed, smaller-sized generating units.

For example, natural-gas-fired, combined-cycle units with a five-year planning horizon can be brought on line in three or four years at a fraction of the cost of nuclear generation. They utilize environmentally compatible fuel and their capacity can be readily expanded in a modular fashion to accommodate increasing demand.

Planning assumptions are just that; they are assumptions. The shorter the time frame, the more reliable they are and the more flexibility you have in meeting energy demands. When the planning horizon is extended out over a decade, as is the case, in nuclear power plants, the crystal ball gets very cloudy indeed. The result is that billions of dollars are committed to address a future scenario which cannot be predicted with any acceptable level of confidence.

In addition to gas-fired, combined-cycle generation, TVA should keep in mind in its future planning new methods of generation using renewable resources, and cost-effective, demand-side management and energy conservation programs. With respect to the latter, the notion of cost effectiveness cannot be over-emphasized. Acceptable DSM and conservation programs must be able to stand on their own economically, and be paid for by those directly receiving the benefits.

In conclusion, I think we recognize that we must go beyond our traditional utility role of supplying safe and reliable electric power and be our customers partners, if they and we are to succeed in coming years. Equally, TVA has to recognize us as a partner, be innovative, flexible, and customer focused. The benefit will be that together we can add value to the future, instead of being a cost of doing business.

Thank you very much for the opportunity.

Mr. CLEMENT. Thank you, Dr. Cordaro.

Now, Mr. Allan Pulsipher, I remember you so well; from our days at TVA.

Mr. PULSIPHER. Thank you.

My name is Allan Pulsipher. I work for the Center for Energy Studies at Louisiana State University. I was TVA's Chief Economist from 1980 to 1988.

I have been asked to talk about the competitive prospects of the Tennessee Valley Authority's power system, basically the third bullet in your letter of invitation.

In my written statement I tried to systematically compare TVA to some of its competitors. It is difficult to compare TVA to other power systems, so I relied on as broad and as simple comparisons as possible. My intent was not to provide a detailed analysis of the relative efficiency of these utilities individually, but to provide a simple and realistic context for evaluating TVA's strategy, prospects and performance.

My overall conclusions are: one, that TVA is uniquely vulnerable to the increasingly competitive electric power industry, and two, that TVA's unique, nuclear-based, supply-side strategy is not a prudent way to protect the interests of its ratepayers.

When its first major round of nuclear cancellations were deliberated in the 1980s, then-TVA board member, Richard Freeman, said that he had to vote to cancel because he would not risk his own money on the nuclear plants in question, were they a private investment opportunity. The Freeman test still makes sense to me, and I think that Watts Bar 1 is the only one of TVA's unlicensed units that would have much of a chance of passing it today.

I want to briefly summarize the findings that lead me to these conclusions. My first conclusion is that TVA is a high-cost producer in an increasingly price—or rate—driven market. TVA will not be able to use contracts or legislation to isolate its customers from the market over the long term. As Larry Hobart, the Executive Director of the American Public Power Association, recently wrote, "Congress has dictated that in 1994, competition is in and monopoly is out." To survive, TVA must maintain its competitive position. If it does not, it will be dismembered as its customers and its distributors are compelled to seek cheaper power elsewhere.

Contrary to what some have argued, TVA's competitive position has not improved as a consequence of the stable rates its customers have enjoyed since 1989, because its competitors' rates have also been stable. As shown in Figure 1 in my written statement, stable rates have been the rule throughout the electric utility industry since the early 1980s.

My second major conclusion is that to remain competitive, TVA must reduce or restrain its costs, or increase its revenues by more than its competitors, because TVA faces increases in costs or revenue reductions that its competitors do not. This is primarily as a consequence of its nuclear program, and the end of the DOE contract settlement revenues.

Further, TVA does not have the financial cushion that stockholders' equity provides its competitors. Figures 2.1 and 2.2 in my statement show, for example, that if Watts Bar were to have come

on line in 1993, as was scheduled, and if the DOE settlement payments had ended in 1992, rather than in 1994, TVA would have suffered \$120 million reduction in retained earnings, rather than enjoyed the \$263 million increase in retained earnings shown on its 1993 books.

But it will be difficult for TVA to restrain its costs or increase its revenues by more than its competitors because: one TVA's non-financial operating costs are as low or lower than its competitors. Figure 2.1 in my statement shows that the revenue per dollar of operating costs earned by TVA and three utilities that are representative of its competitors. On a gross basis TVA earned about 25 percent more than its competitors. On a "pure" operating cost basis, that is operating costs net of taxes and depreciation, TVA was about 13 percent more efficient.

This is good news, but it is also bad news. Unless one assumes that TVA's competitors are considerably more inefficient than TVA is—and they were not; they were among the best managed and operated utilities in the nation—this means that the prospects for TVA to maintain its competitiveness by cutting its operating costs are simply not very good.

The reason that TVA is a high-cost producer, of course, is the unique financial burden it bears as a legacy of its unrealized investments in nuclear generating facilities. In my written statement, I show that on a gross basis, TVA labors under a financial disadvantage of about 75 percent. In other words, TVA would have to earn about four times as much as it did, per dollar invested, to equal the return on capital enjoyed by its competitors. If dividends that were paid by its competitors were treated as a cost, rather than a return, the disadvantage is reduced to about 50 percent, but it is still there.

Similarly, opportunities for TVA to maintain its competitiveness by increasing its revenues by more than its competitors are not good for three reasons.

First, independent forecasts indicate that economic activity within TVA's service area will grow no faster than will its competitors. TVA's stable rates will not bring the Tennessee Valley more economic growth than its neighbors because, as I pointed out, stable rates have been the rule there as well.

Moreover, as Figure 5.1 in my statement shows, TVA's forecasts of load growth have been among the most bullish in the nation. I have added to my written statement a companion chart (5.2), which shows that if you measure TVA's projected load growth relative to the U.S. average, TVA's load forecast shows a remarkable growth, relative to its competitors in recent years. In 1987, TVA projected that its peak demand would grow at the same overall rate as the national average, about 2 percent per year.

As TVA's resolve to finish its nuclear program stiffened, three years later in 1990, TVA's 10-year projected growth rate had increased to 3.1 percent, which was 63 percent greater than the national average, and the highest in the nation. Over this same period no similar resurgence of optimism shows up in the forecasts of TVA's competitors.

The second reason TVA is unlikely to increase its revenues by more than its competitors is that as a high cost supplier, prospects

for long-term off-system sales are not good even if any legal barriers were to be removed.

Finally, both within and without its service area energy conservation and improved energy efficiency will provide TVA its most immediate and relentless competition.

My third major conclusion is that, paradoxically, over the past five years TVA has been able to maintain its competitive position largely because of its higher debt. That is proportionately more high-cost TVA debt meant proportionately cost reductions from refinancing that debt for TVA as interest rates fell.

Figure 4 in my statement shows a rough calculation of the relative benefit from falling interest rates enjoyed by TVA and its competitors. It shows that saving for TVA were on the order of six to seven percent of total revenues, while savings for TVA's competitors averaged only between one and two percent.

TVA's larger savings, I should add, is a consequence of its larger debt, per se. TVA's competitors were just as effective in reducing their interest costs on a per-unit-of-debt basis. Unfortunately, in the future TVA cannot rely on continued reductions in interest costs to maintain its competitiveness, since it is unlikely that interest rates will continue to fall, and TVA's high cost debt has already been refinanced, or is in defeasance.

My fourth and last point is that although doing so will not resolve TVA's current difficulties, these difficulties provide a persuasive reason for modernizing TVA's system of governance and accountability. To my knowledge, every independent analyst that has looked at TVA in recent history has recommended that TVA's autonomous, three-member, full-time board, charged both with managing and regulating the agency, should be replaced with a larger, regionally based, part-time board, clearly separated from TVA's management.

Given the support that TVA enjoys, both in the Congress and the Executive Branch, now is a propitious time to amend the TVA Act to make such changes. To use the jargon of the moment, Marvin Runyon did a lot to reinvent TVA. It is now time for Craven Crowell, the Congress, and Vice President Gore to finish the job by giving TVA a 1990s rather than a 1930s kind of board.

I'll be happy to answer any questions.

Mr. CLEMENT. Thank you, Mr. Pulsipher.

Mr. Head, you mention in your testimony that five of your members no longer are on standard ten-year sole source of supply power contracts with TVA. How many of your members have close enough access to other utilities that they could potentially meet that power requirements from suppliers other than TVA?

Mr. HEAD. I haven't counted them, but all those that are on the perimeter would have that opportunity. If there is a lower-priced power supplier to them, then they would have that opportunity.

Mr. CLEMENT. Do you anticipate a greater number of distributors notifying TVA that they plan to leave the TVA power system?

Mr. HEAD. I certainly hope not, but I think it is a distinct possibility. Each one of us has a responsibility to the people that we serve to serve them in the best manner, and with the most feasible costs, or the cheapest costs, and each one of us is going to have to analyze the future and determine whether or not TVA is the power

supplier of the future. Certainly we are proposing to do everything that we can to help TVA be the power supplier of the future, but we think there is a tough battle in front of us.

Mr. CLEMENT. Would distributors want provisions in their TVA power contracts to allow them to enter into co-generation agreements with industrial customers?

Mr. HEAD. I think this is certainly one of the areas that we are going to have to look at. A ten year notice provision is entirely too long. A sole source supply contract that leaves the distributor so that he cannot have co-generation or purchase power on the spot market, or look at other avenues; these are things that the 1992 Act are bringing on that we are going to have to look at. We are in an era of competition and the present contract that we have with TVA does not fit itself for that competition.

Mr. CLEMENT. Alright, thank you.

Mr. Soles, what are utilities outside the TVA service area doing in response to the competitive changes brought about by the Energy Policy Act of 1992? Can you respond to that?

Mr. SOLES. I think I can. I think they are responding in areas of the types of products, or types of services that they provide for their industrial customers, in particular. I think they have responded, actually before that, with industrial interruptable rates, and other types of products, economic development rights to retain customers. They are doing load retention rates, things like that. Commonwealth Edison, for example, has petitioned the Illinois Commerce Commission to have a contract rate fee, which is a load retention-type rate for those customers that can leave their system by co-generation.

Mr. CLEMENT. Dr. Cordaro, you mention in your testimony, the importance of TVA making use of demand-side management and energy conservation programs. Could you assess for us how adequate TVA's DSM and energy conservation programs have been so far?

Mr. CORDARO. Since I have been with Nashville Electric Service, and that has been for about nine months now, it seems that most of those programs have been on hold as far as what direction they are going and where the emphasis is going to be. I think there is some activity, some interest in marketing, some interest in revisiting those areas; but I think as you can gather from Chairman Crowell's comments today that a significant increase in interest in DSM and conservation programs is probably on hold until the results of the IRP become available.

Mr. CLEMENT. You mentioned about natural gas fired generation units as an economical approach to increasing generating capacity. What are the current costs for this type of capacity per kilowatt hour, including capital costs?

Mr. CORDARO. From a capital cost standpoint, a general number or guideline is about \$1 million per megawatt for the construction of a natural gas-fired combined cycle generating facility. The costs in cents per kilowatt hour vary depending on the kinds of fuel contracts you negotiate to supply these different units. That varies throughout the country. In fact, from an operating standpoint, 80 percent of the costs for those facilities is probably fuel dependent.

So, a lot depends on the kind of gas contract that you can negotiate.

I have been involved in projects and very, very close to projects that produce electricity with a total cost in the five to six cents per kilowatt hour range, and even four and a half cents per kilowatt hour range, in very high cost regions, such as the Northeast.

Mr. CLEMENT. On this question, either you and Mr. Pulsipher can respond to if you so desire. What will happen to TVA rates when Department of Energy power revenues end this year, and TVA's depreciation expenses increase after operations start at Watts Bar Unit 1?

Mr. PULSIPHER. According to testimony we heard today, nothing. That is TVA testified that rates aren't going to change. But in terms of what that would mean to the numbers on its financial statements, it would result in a reduction in TVA's retained earnings. That would be the effect of that today.

Mr. CLEMENT. Mr. Pulsipher, can TVA sell wholesale surplus power outside of the TVA service area at a price that exceeds the cost of generating nuclear power?

Mr. PULSIPHER. Well, there are two aspects of this. Sometimes they are confused. One, if TVA had already sunk the money and built the plant, it would—I assume—sell the power as long it recovered its variable costs. Whether or not, though, TVA wants to invest in order to do that, and how much risk is involved in doing that, I think, is the real question. In my view, the time to sell power outside the TVA system was the early 1980s. Since that time, either other utilities have stepped in and taken those contracts, or technology has caught up with big-generation facilities. I don't think that the prospects are good for TVA to sell large amounts of power outside the TVA system.

Mr. CLEMENT. What will be the estimated cost of electricity generated by Watts Bar Unit 1 and will these costs exceed the generation costs of TVA's electric utility competitors?

Mr. PULSIPHER. I have not looked into Watts Bar on a detailed basis. My hunch is, though, that the costs would exceed either the electricity available from its competitors, or from TVA's older more efficient coal-fired, plants.

Mr. CLEMENT. Mr. Duncan.

Mr. DUNCAN. Thank you, Mr. Chairman.

Gentlemen, I am sorry I had the other meetings that I had to attend, and missed a lot of your testimony, but I have read your statements.

Mr. Soles, you say at one point that first "we hope that members of the subcommittee will share our view that debt, in and of itself, is not necessarily bad. For one thing, it can be a very important reflection of growth. If the business is growing, a proportional growth in debt is acceptable. In our view, TVA should focus—and we believe it is—on a number of areas besides just the total debt figure. The first focus should be on debt service . . ." and so forth. You seem to indicate from that you are really concerned or worried about this debt that TVA has. Is that accurate, or do you think it is a serious problem? Or do you feel that it is being handled in the proper way at this time, and really everything is alright?

Mr. SOLES. I think that if you put that in the context of the growth potential that the area in which TVA operates under the current operating system, I think that is the key. I think the key is growth. If growth doesn't materialize, then I think a different management of that debt would have to occur.

I would have to say we feel like they are handling it well within the context of a growing environment.

Mr. DUNCAN. Do you think it is going to be a potentially unsolvable problem in the future? In other words, do you think it is going to get out of hand, or is it something that you think is all right, is acceptable?

Mr. SOLES. Well, I said under the current forecast for growth, I think it is manageable. I think the IRP process, and one of the things that should come out of it, is obviously what resources you're going to have in the future. That will probably determine where that debt is going to be capped in the future, I think. So, I would hope that the IRP process would lend some light on that in the extended future. In the near term, I think we are satisfied that it is being handled in an acceptable manner.

Mr. DUNCAN. Dr. Cordaro, I assume you heard Chairman Crowell testify about the Watts Bar facility; that he felt that it was a one percent decision on his part, or language to that effect. Do you recall that?

Mr. CORDARO. Yes.

Mr. DUNCAN. I guess the gist of his testimony was that he felt there was no other decision that could have been made; that it was just common sense to go forward with it, since he felt the plant was 99 percent complete, and so forth. Yet, I notice in your testimony you said, "I urge TVA to carefully balance its ambitious nuclear program against the potential benefits of meeting future needs for power through disbursed smaller generating units. For example, natural gas-fired combined-cycle units, with a five year planning horizon, can be brought on line in three or four years at a fraction of the cost per megawatt of nuclear generation."

In saying that, do you mean to indicate that you don't think that TVA should go ahead with the Watts Bar facility now?

Mr. CORDARO. Those remarks were directed more at the four plants that are the central focus of the IRP; Watts Bar 2, the Bellefonte units, and Brown's Ferry 1. I can appreciate the kind of decision that Chairman Crowell had to make with respect to Watts Bar 1. I was involved in a nuclear facility that had a significant amount of sunk costs in it. It was a hard decision to walk away from something like that. I think, and I hope, his decision was a wise one and a good one, but only the future will tell.

But a large part of that decision has to revolve around your confidence in what the future operating costs of that kind of facility would be. If, indeed, you did not have confidence, or you experienced poor operating situations in the future, and your costs were much higher than predicted, then the decision in hindsight might have been better to walk away, rather than to complete the plant, even if only one percent of the capital costs was involved.

Mr. DUNCAN. Of course, there were factors that TVA ran into in the late 1970s that were sort of far beyond its control and totally unexpected that caused sort of the problems that have occurred

with all of this nuclear capability, or there was the oil crises in the late 1970s and several other things that Chairman Crowell mentioned in his testimony; the sky-rocketing interest rates, and so forth. That, in his opinion, led to a lot of these extra costs that were incurred. Did you hear anything in his testimony that you strongly disagreed with?

Mr. CORDARO. No. I agree with that characterization, and many people lived through that. I lived through that situation, also, and it is unfortunate. But because I lived through that, and because nuclear projects are subject to so much uncertainty, and the fact that the planning horizons for them are so long, beyond ten years, and involve billions and billions of dollars; I would feel more comfortable with a scenario which has a shorter lead time, and allows you more flexibility, without having to invest that kind of money in a future that you can't be too certain about.

Mr. DUNCAN. You just think they are too big a gamble?

Mr. CORDARO. Yes. Exactly. And I come from a nuclear background, and if anyone was pro-nuclear at one time, it was myself. As I said, I am gun-shy from a business risk standpoint, having lived through a catastrophe in a similar situation.

Mr. DUNCAN. Does it cost us, in this country, a lot more to build a nuclear facility than it does in other countries around the world?

Mr. CORDARO. I think so. I think it obviously takes a much longer period of time.

Mr. DUNCAN. Much longer, certainly.

Mr. CORDARO. And that extends the construction process. I think we have some very, very high standards. I think we also suffer from the lack of standardization in nuclear plants. This has contributed to the high cost in nuclear facilities. That has not been the case in some other countries where they have standardized plant specific designs, and have been able to expedite the construction process.

Mr. DUNCAN. I guess it would be fair to say there is, for whatever reason, there is much more fear of nuclear power in this country than there apparently is in some other countries around the world? That has led to some very small groups being able to place requirements on nuclear facilities in this country that maybe aren't required in other countries. That is why, for example, that is has taken us 22 years to with Watts Bar, as compared to four years in Japan, and six years in France.

Mr. CORDARO. I think people who are concerned about nuclear power in this country have been very successful at putting it to the test, and providing some obstacles. I think, unfortunately, certain events took place, too, which helped the cause, as far as obstacles to nuclear power, such as T.M.I., and Chernobyl, and things of that nature, which you could not predict. However, there are other countries, throughout the world, where there are considerable fears and questions about nuclear; Sweden was one, Germany is another. That has created some difficulties in those countries.

Mr. DUNCAN. Yes. We have a vote going on, but let me ask Mr. Pulsipher this: You say in your testimony, you have, at points, some questions, you say, if TVA is to survive. Is there some question in your mind about whether TVA is going to be able to survive?

Mr. PULSIPHER. I think TVA, as I said in the testimony, faces some unique threats. There is a possibility that it would end up in 10 or 15 years looking very different than it looks today.

Mr. DUNCAN. Let me ask you this: You close out your statement with these words. It says, "To relapse into popular jargon, Marvin Runyon did a lot to reinvent TVA. It is now time for Craven Crowell, the Congress, and Vice President Gore to finish the job by giving TVA a 1990s, rather than a 1930s, kind of board." It is easy to say those kind of things, that sound forward looking and progressive, but what do you specifically mean by that?

Mr. PULSIPHER. What I specifically mean is that TVA is under a handicap because it has three people who are supposed to both regulate and manage the agency. Those dual responsibilities get mixed up, and it becomes very hard for TVA to recognize and correct past mistakes.

Mr. DUNCAN. The board, though, has always hired managers to manage almost every different aspect of TVA operations.

Mr. PULSIPHER. But they directly supervise those managers. Those managers report to them, and the board becomes—I don't want to say this in a pejorative way—implicated in the managerial decisions that have been made. What TVA needs is an independent regulatory board.

Mr. DUNCAN. Don't you think, though, that those managers should have somebody that they have to answer to?

Mr. PULSIPHER. They should have to answer to the Chief Executive Officer, whom the part-time, regionally based board—like any other corporation has—would review their performance and fire them, if they were not doing a good job.

Mr. DUNCAN. You don't think it is happening now? In other words, you don't think these managers who have to answer to, or be accountable to the board, you don't think that TVA is replacing managers who haven't done a good job?

Mr. PULSIPHER. I am not saying this with any particular individual or set of individuals in mind. I am saying there is a structural or organizational defect in the TVA system. TVA needs a new board structure. In my statement I say, for example, that the changes and the re-evaluations that TVA has made about its nuclear program, in a real sense, are sort of incidental by-products of the last presidential election. Had President Clinton not been elected, and had President Bush been re-elected, TVA would not have two new board members. We would not have had a new look at TVA's nuclear program. In my opinion, if President Bush had been re-elected TVA would still be going full bore, to complete all of its nuclear units.

Mr. DUNCAN. I have a hard time understanding how, though, replacing one board with another board is really going to help that much.

Mr. PULSIPHER. Because the new board would have only a policy and a regulatory purpose. It would be part-time; it would be based in the region; and it would regulate TVA just like a corporate board regulates a corporation.

Mr. DUNCAN. You are saying a part-time board would be better than a full-time board, but on a full-time board, the members are

obviously going to know a lot more about it than any part-time board would.

Mr. PULSIPHER. That may not be the case. But in order to regulate, the board doesn't need to know all of the managerial or operational details.

Mr. DUNCAN. You know that in this IRP that they are going to set up a review group with 15 to 20 members that really would function as a part-time group set up to review.

Mr. PULSIPHER. The IRP review group is being set up to look at one specific study. After that study is over the group will be gone. Whether the group is going to have the ability and the resources and the organization it needs to even supervise that study, I think, is questionable.

Mr. DUNCAN. Thank you very much. I guess we better go vote.

Mr. CLEMENT. Thank you very much. Mr. Duncan and I will need to go vote.

Mr. Hirst, I know you have to get out of here very soon. Can you wait till we get over there and back, or do you want to go on and make your statement now?

Mr. HIRST. I need to leave around 3:00 p.m.

Mr. CLEMENT. Okay. We'll be right back.

[Recess.]

Mr. CLEMENT. Our fourth panel, Mr. Eric Hirst, Corporate Fellow, Oak Ridge National Laboratory, U.S. Department of Energy; Dr. Edward Passerini, Professor of Environmental Studies, University of Alabama; Dr. Steven Smith, Executive Director of the Tennessee Valley Energy Reform Coalition.

All of you, if you will, please stand and raise your right hand.

Do you solemnly swear that the testimony you will give before the subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

[Panel answers affirmatively.]

TESTIMONY OF ERIC HIRST, CORPORATE FELLOW, OAK RIDGE NATIONAL LABORATORY, U.S. DEPARTMENT OF ENERGY; EDWARD PASSERINI, PROFESSOR OF ENVIRONMENTAL STUDIES, UNIVERSITY OF ALABAMA; AND STEVEN SMITH, EXECUTIVE DIRECTOR OF THE TENNESSEE VALLEY ENERGY REFORM COALITION

Mr. CLEMENT. Mr. Hirst, I know you have to catch an airplane. All of your testimony will be accepted into the record, as if read. If you will summarize your comments, we will make sure you make that airplane.

Mr. HIRST. Thank you.

This is difficult testimony for me to give, not because I have to catch an airplane. I work with electric utilities throughout the country. I have worked with Central Maine Power and New England Electric in the Northeast; I have worked with Bonneville, Seattle City Light and Puget Power in the Northwest; and with Duke Power and Georgia Power in the Southeast.

All these utilities run competent, honest and open integrated resource planning processes. As a consequence, their resource plans yield substantial economic and environmental benefits to their cus-

tomers. I just wish I could say the same about my local utility, the Tennessee Valley Authority. Unfortunately, I can't.

It seems to me that year after year, TVA pursues a narrow, single-minded resource strategy that ignores what the rest of the country knows, and more important, ignores the advice and concerns of its customers.

I would like to say a little bit about a few key IRP principles that I have learned in the seven years that I have directed our work at Oak Ridge National Laboratory for DOE's IRP program, and then indicate how I think TVA is doing relative to these principles.

The overall purpose of IRP is to consider a broad array of different ways to meet customer energy service needs. One key aspect of that is to consider all resources fully and fairly. That includes a variety of supply resources, different fuels, technologies and ownership forms. It includes demand-side management, energy efficiency and load management. It includes transmission and distribution; and it includes pricing.

The second IRP principle that is important here is to encourage participation in both the development and the review of the resource plan by outside experts and customers.

And the final principle I'll mention is to treat uncertainty explicitly.

The majority of the larger U.S. utilities now routinely do IRP, embodying these and other IRP principles. From what I can tell, so far at least, TVA does none of this. TVA has said, since the Fall of 1991, that it will conduct a "world class IRP," but so far, at least, it has not provided any detail so that outsiders can see what it is going to do or why.

I think there are four issues that I hope the subcommittee will address, most of which in one form or another have come up already today. The first is what role will the TVA IRP review group play?

Because of the governance issues that Allan Pulsipher mentioned, it is very important that this outside group have available to it the resources and technical competence so that they can independently review TVA data, assumptions, analytical methods, model results and conclusions. For me at least, the key is TVA's provision of funding to this group so that they can hire some independent expert consultants, who will report to the review group, not to TVA.

I was very encouraged this morning at the exchange between you, Mr. Chairman, and Mr. Crowell, in which as I understood it, Mr. Crowell committed to providing that funding so that this outside review group can provide independent counsel to the TVA board.

This is especially important to TVA relative to other utilities, because of the long history of TVA's staff inability to accurately project what it will cost to build power plants, and how long it will take to get them on line.

The second issue that I am concerned about is the status within the IRP of Watts Bar 1, Bellefonte 3, and Sequoyah Units 1 and 2. I don't question the TVA decision to take them outside the IRP, and treat them as commitments, but I would like to know what the basis is for the TVA decision to do so.

We heard from Mr. Crowell this morning that Watts Bar 1 is 99 percent complete. Unfortunately, we have heard that before. Going back to the third of my IRP principles, to treat uncertainty explicitly, I am afraid that once again TVA is ignoring uncertainty, and going only with a set of optimistic base case assumptions.

Again, I am not questioning this decision. I can't. I don't have information available from TVA on the pros and cons, or the basis for TVA's decision, but I think that such information should be made available to all the parties who are interested in the IRP process.

The third issue has to do with Watts Bar 2, Bellefonte 1 and 2, and Browns Ferry 1. These are issues that TVA is appropriately considering as options within the IRP. My concern is whether TVA is spending more than the minimum amount of money needed to maintain these as options this year and next year. That is are they converting these options into commitments by spending a lot of money so that the marginal cost to complete the plants will get lower and lower. In other words, is TVA foreclosing what might turn out to be better options, such as demand-side management, renewables, purchased power and gas-fired power plants.

Again, I don't know. What I am asking for is information, information that any other utility in the country would provide—and provide readily—but that TVA seems, for one reason or another, not able or not willing to provide.

The final issue is the amount of time it has taken for TVA to initiate and complete its IRP. TVA announced in Fall 1991 that they were going to do a world class IRP. The current plan calls for completion of that plan at the end of 1995. I wonder why is it going to take TVA, with all of its human resources, more than four years to complete an IRP, when lots of other utilities do the whole process in six to 12 months?

In conclusion, because of TVA's independence, this subcommittee, and the Congress in general, must act to ensure a comprehensive, honest, open and expeditious IRP. If you don't intervene, it will allow TVA to continue its narrow focus on what I think is a failed construction program.

Ultimately, this will wreak havoc on the Tennessee Valley when the customers, including me, are called upon to pay off this enormous debt.

On the other hand, if TVA is really serious about its IRP, I think there is time left so that we can develop an energy future for the Valley that meets customer energy needs at reasonable costs, and in an environmentally benign way. Let's hope that with your help, TVA chooses that second path.

Thank you.

Mr. CLEMENT. Mr. Hirst, I heard what you heard this morning when Chairman Crowell said he would include all of its nuclear plants in the integrated resource plan to determine the least-cost method of providing electricity to TVA service area.

I think with TVA experiencing so many construction and operating problems with its nuclear plants in the past, and with the enormous cost associated with TVA's nuclear program, I think it would be a sad day for all of us if that didn't happen.

Mr. HIRST. I hope you are right. I didn't hear exactly what you heard. What I heard, and I may be referring to something that TVA put out last month, but my understanding is that certain plants; Watts Bar 1, Brown's Ferry 3, and Sequoyah Units 1 and 2 are not to be considered in the IRP.

Mr. CLEMENT. Well, I had heard that earlier, but from what the Chairman said today, I was under the opinion that all of them would be part of the integrated resource plan, but I will get a clarification on what was exactly said.

Mr. HIRST. I hope what you heard, Mr. Chairman, is correct. That would be very good news indeed. It might lead to the same conclusion that TVA had before. It may turn out that after the IRP process is complete, it really does make sense to go ahead with all these plants. All I am asking for is a full and honest, open hearing on these issues.

Thank you very much.

Mr. CLEMENT. Thank you, Mr. Hirst.

At this time, Dr. Edward Passerini.

Mr. PASSERINI. Mr. Chairman and Members of Congress, ladies and gentlemen, I am Ed Passerini. I am a professor at the University of Alabama. I am a resource economist. I am vice president of TVERC.

TVA was a wonderful agency in the 1930s, 1940s and 1950s, but I am afraid that George Norris and David Lilienthal are turning over in their graves today.

You have asked me to answer four questions. I'll do so as briefly as I can, and then address some of the issues that have come up today: (1.) an explanation of load forecasting, and a comparison of forecasting at TVA and at other utilities. Let's just look at the last diagram. This is in your packet if you have it with you. I am not going to go over the bad decisions that were made back in the 1970s. Chairman Crowell said that since 1985 that has all turned around. If you will look at the projection that was made in 1985, and at precisely the same projection that was made in 1992, you will see that it hasn't turned around at all.

Now, where do they get these outrageous straight lines that keep going up well into the foreseeable future, here a 20-year projection? Electric companies essentially work with the left hand and the right hand. The left hand says we are going to look at what we really think are going to be the needs in the future; and the other hand looks at what we really hope the needs will be in the future, because we would like to build some more power plants. Of course, public utility commissions give a rate base based on the capital expenses, so it is in the interest of a utility, in one sense at least, to build as much as they possibly can.

TVA, of course, should be free of that kind of right hand analysis, but instead they clearly are the worst utility in the country, because they plan almost entirely in terms of being driven by the plants that they want to build rather than by the actual needs. We can look at the numbers on all that, if you like.

(2.) An explanation of why load forecasting is incorporated into an IRP, and how it is used to help determine least-cost alternatives:

By the way, about that Colorado nine-month IRP: Mr. Crowell said that we want to make sure it is done right at TVA, so we are going to take plenty of time. That Colorado IRP was an open, transparent, excellent study. It can be done in a short time, if you go about it the right way. That Colorado study had a lot of demand-side management techniques, very good specific ones, built into it.

Mr. Crowell said that all nine units are going to be included, but on the other hand, as Mr. Hirst said, when we talk about what is "on the table", we typically talk about two or three units, not all nine units. So there is a good deal of clarification that is going to be necessary there.

Debt levels clearly are going to reach critical phase shortly, and I would urge you to keep a short leash on TVA, and look at this carefully. The ceiling will be reached perhaps months from now, if not a year from now, because, with \$25.3 billion confessed, and \$3 billion more in debt coming on line in October, quite clearly no matter what figures you use we are going to be crashing into that \$30 billion debt ceiling quite soon.

(3.) An assessment of TVA's reserve margin methodology and how it affects load forecasting:

You have the one-pager that I wrote about that. Mr. Crowell does, too. He said this morning, "I don't know where he gets those numbers." They come right from that page. It is really a very simple calculation. I'll be happy to discuss that if you like.

Someone asked this morning if TVA had done any studies about sensitivity to various capacity factors for the future, and the answer was a bit fuzzy. The answer is, no. That is very sad. Not only are multiple scenarios of possibilities for the future being ignored, but capacity factor is only one of them. Not only that, but you heard Chairman Crowell refer to the 50 to 60 percent overall capacity factors. Whereas, if you look at the actual numbers—this is enclosure number four—you will find that it is 35.44 percent—35 percent. I have a guess as to where you can get number close to 50 percent. That is if you exclude all capacity factors from 1985 to 1989, and regard them as being capacity factors derived from an agency that was partially on administrative hold. But understand that it was on administrative hold because of enormous safety problems at those plants.

Let's see, where to go from there?

(4.) An assessment of TVA's power program and whether TVA is taking the necessary steps to respond to the competitive changes now occurring.

I don't think so. Certainly demand-side management is at zero in TVA, compared to what is going on in the rest of the country. None of this business of buying back old refrigerators and new fluorescent lighting, and all that that's going on in the rest of the country. TVA once did have that sort of policy, back through the 1950s. Then it was abandoned under Wagner; then it came back in under Freeman, and is no longer there.

Mr. Crowell said he can't understand why he would stop now on a plant that is 99 percent complete. Well, if you look at the operating figures for new nuclear power plants, it becomes very understandable.

This is *Public Power*, a very good magazine, a very pro-industry magazine. But an Integrated Resource Plan completed by PGE, Portland General Electric, last year, showed that operating the Trojan plant to the end of its license, the year 2011, would require investment of \$200 million to replace the plant steam generator. Such an investment would not make Trojan the utility's least cost power option.

That is the answer. Trojan was 100% complete. Sometimes even when a plant is 100 percent complete, the most sensible thing to do is to stop operating it, if it is not your best option. Utility after utility, throughout the United States, has found that other options are far better and far lower cost than completing and running plants.

Mr. Mineta said we expect TVA to take the necessary steps to solve these problems. So far, there is very little indication that that is happening. I mentioned that the 1992 projections look exactly like the 1985 projections, and someone pointed out this morning they are on the Florida growth level. That is absurd.

I was distressed by one comment this morning that I hope I misunderstood by Mr. Clement, that we use independent data to confirm TVA's projections. Independent data will not confirm TVA's projections. Independent data will show quite a different picture from TVA's projections.

Mr. Barlow was concerned about clean coal scenarios. So, am I, but the only way in which you are going to meet the clean coal scenarios of the future—because we are going to be less and less worried about sulfur dioxide emissions and more and more worried about carbon dioxide emissions—is to be much more efficient in the production of coal based energy.

There are only a few ways to do that. In other words, you have to move from the 40 percent level of efficiency of coal burning now, to much higher levels. The best way to do that is magneto hydrodynamics. The TVA had an MHD program, and stopped it. You can get perhaps up to 80 percent efficiencies out of MHD.

TVA also worries about drought management of its reservoirs, because, of course, they are getting hotter and hotter. TVA, during the 1950s, had a wonderful program in reforestation, and tree crops, and all the things which result in stream management and cooling down of reservoirs. They have quit all that.

So, as we talk about an integrated resource planning process, we have to do that. We have to talk about integrating all these things, so that we have a system. TVA, of course, is one of the few units, perhaps the only in the country, that has the resources and has the capability of doing this sort of thing, to do the programs that they should be doing, such as the tree planting programs, and MHD research, and so on, to make it a world class institution, rather than the kind of institution that we have observed in the last couple of decades.

A couple of specific comments: Mr. Crowell said that TVA's projections have been within five percent every year. Well, if you make a projection every year, it is very difficult to be off more than five percent. But, if you are off four percent in the same direction for 20 years, which is what they have been, you have an 80 percent

error, which is what they have, and therefore, a \$27 billion, give or take a few billion, debt.

He commented that the Baracat and Chamberlain study showed that their projections were okay. I'd be delighted to go over the Baracat and Chamberlain study with you, and show you that it is essentially a white-wash.

I want to comment on this reserve margin business, because you have the projections in front of you that show that TVA has somewhere between a 27 and 37 percent reserve margin. If we put Watts Bar on line, it will go up to between 37 and 47, which is outrageous. You also have in front of you the way in which TVA tries to show that there are lower reserve margins.

Mr. Crowell said that this winter, when the worst storm in 120 years hit the area, that we wound up with a reserve margin of only five percent. The whole idea of reserve margin is to economically meet most of the conditions that you anticipate. During the worst storm in 120 years, typically you drop below zero on the reserve margin. As I am sure you know, Pepco and Maryland Power, and so on, did.

One of the things we have tried to do is to give hospitals emergency generators in the last two decades in order to insure that we can operate our energy utilities economically and still be able to do alright during a large, 100-year event. TVA, having a five percent reserve margin over the amount necessary in that event is an outrageous amount of power to be having available, and clearly dis-economic. If TVA were servicing its debt at the levels that it should, it would have to be raising its rates sharply and then, of course, the true competitive position between TVA and its more efficient neighbors would become clear.

At this point, said Chairman Crowell, I don't know what TVA's environmental niche should be. I suggest that there are many things. If you look at the end of the testimony that I submitted, you will see 10 points, 10 working points, and then a series of recommendations as to what TVA's environmental niche should be. Just a couple of points: Clearly demand-side management, and dozens of specific things that can be done there.

If we talk about renewables, let's think about things like the recent Swiss study which showed that using 60 percent of the roof area in Switzerland with photovoltaic solar cells, they could provide all the power needed for Switzerland. That is a rather far-out kind of thing, but it seems to me that it is that kind of far reaching research that a place like TVA ought to be doing. This is not something that a private utility can afford to do, but this is the kind of thing that would make TVA IRP a world class IRP, but there is no interest, I think, in TVA in doing those sorts of things. There is no interest in finding the lowest cost solutions.

For example, TVA put in an electric car test track many years back. There are two solar car manufacturers in the TVA area, and as far as I know, neither one has ever been invited to use the test track.

I want to comment just a moment on transparency, because those of us who deal with TVA frequently find that it is a very opaque industry. It is very difficult to get data. Sometimes I have to get my data from the NRC, rather more directly from TVA, or

from Charlie Komonoff via the NRC, instead of directly from TVA. That should not be.

Mr. Crowell says, "I want TVA to become an environmental leader in an area that emphasizes our uniqueness, and is beneficial to this region, something that becomes nationally known because it works here. That is what I am after."

Well, that is what all of us are after, but not what we are seeing. I hope you gentlemen will, indeed, hold TVA's feet to the fire, and try to make it become the agency that it should.

Thank you.

Mr. CLEMENT. Thank you, Dr. Passerini. After Dr. Steve Smith, we will have several questions for both of you.

To set the record straight, what I said this morning, when I asked Chairman Crowell several questions: If TVA's data is accurate, then the independent analysis would merely confirm the data. I did not say that the TVA information is correct.

Mr. PASSERINI. Thank you. That is what I was hoping.

Mr. CLEMENT. Right.

Dr. Smith.

Dr. SMITH. Thank you.

Mr. Chairman and members of the subcommittee, my name is Stephen A. Smith, and I am the Executive Director of the Tennessee Valley Energy Reform Coalition. Our organization was formed out of a growing realization that the energy policies of TVA were fundamentally out of step with the rest of the country.

TVERC represents concerned citizens within the TVA seven-state service area. TVERC's technical advisory board has grown to include national energy experts who share our concerns. Our mission is to make TVA environmentally and financially accountable to the people of the Tennessee Valley. This mission will only be successful through the reformation of TVA's current energy policies, and the restructuring of the TVA decision making process.

TVERC seeks to become an effective voice and messenger of a new vision for the Valley. We have advocated that TVA open up its decision making process to the public. We have actively tracked the integrated resource plan from before its Congressional mandate through its concurrent delayed and yet ill-defined status. We have been publicly critical of TVA's lack of leadership and minimal efforts in the field of energy efficiency and demand side management services.

Historically, TVA has represented the best of Government planning. TVA was a positive force in change in our region and the country, from rural electrification to flood control and reclaiming and restoring ravaged lands, TVA was viewed as good government at work. Over the years, TVA has been presented as a national and international model. Its historic importance to this country cannot be overstated.

Within the past few decades, however, the agency has lost its focus. Through a series of miscalculations and inflexibility, TVA has become an embarrassment and a potential burden to our region. The issues I raise here today are crucial. If we treat them seriously, then we will have taken the first step along the road to recovery. That is why TVERC exists, to expose difficult problems and

propose better solutions that will serve as a road map to returning TVA to a position of leadership for our region and our country.

I want to focus on a few points. Some of these have been hit on, but I want to emphasize them in a special way, because I think the information presented this morning leads to a different perspective at times. Today, TVA carries the largest financial debt of any utility in the country. The Office of Management and Budget presently lists TVA's debt at over \$25 billion. We have even heard today that if you include the defeased debt, it's over \$29 billion.

In 1990, Virginia Electric Power Company, about half the size of TVA, had a debt of about \$3.8 billion and was paying about \$356 million in interest. Duke Power, another large TVA neighboring utility, had a long-term debt of \$3.1 billion. Similar comparisons can also be made with other utilities in the west. No other utility has a debt that comes close to TVA's.

William Malec, TVA's Chief Financial Officer, in a recent letter to the editor in a regional paper, appears comfortable with the magnitude of this debt, and claims that it is "just the cost of doing business." As a ratepayer and a concerned citizen, I find it disconcerting that no other utility in the country finds it necessary to carry this level of debt to provide energy services to its customers. Indeed, over 36 percent of TVA's operational budget, or \$1.8 billion, goes to service interest on this debt.

While Malec has been effective in taking advantage of lower interest rates, the millions he so eloquently described as saved are still orders of magnitude below the billions he will not discuss.

Amazingly, TVA has no publicly-stated plan to repay this debt. As demonstrated by the savings and loan crisis, and the Federal deficit, unregulated spending and massive debt will lead to financial crisis and economic instability. TVA should be commended for addressing the spiraling rate increases of the 1980s. At the same time, the failure to adequately control high levels of spending has resulted in continued increase of TVA's debt, thus setting the stage for future rate shocks more severe than those of the past.

Another disturbing scenario with national implications is the possibility of TVA defaulting on its bonds. With a default, the possibility for Federal bailout cannot be dismissed. TVA's current Wall Street AAA rating is not based on sound financial condition, rather, Standard & Poors has stated that the bond rating stems more from the implicit support of the Federal Government.

If recent trends continue, over \$1 billion will be added every year to this growing debt. TVA now is rapidly approaching the \$30 billion debt ceiling authorized by Congress in 1979. The original intent of this \$30 billion credit line was to complete 17 nuclear reactors. Today, only two units are operational, with the promise that one will come on line in the near future. This does not demonstrate sound financial management.

The agency now stands at a financial crossroads. TVA can ask Congress to extend the \$30 billion debt ceiling or the agency can tighten their belt and make the tough decisions about future expenditures on this power program. TVERC believes that the time has come for TVA to address the root cause of their financial mismanagement and deal responsibly with this massive debt.

And if you look at the root cause, the place you're obviously going to go is TVA's nuclear power program. The TVA nuclear power program has been the largest drain on the agency's financial resources. The nuclear power program also serves as the clearest example of how lack of accountability and poor management practices have led this agency astray.

It is ironic that TVA is the only utility in the Nation actively constructing nuclear power plants while all other utilities, or many other utilities, are cancelling nuclear facilities under construction or retiring nuclear plants prematurely. This trend away from nuclear power investment is largely attributed to rigorous economic analysis mandated either by public utility commissions or by thoughtful utility managers.

Indeed, TVA's Chairman Craven Crowell was recently quoted in TVPPA publication as saying, "If we were a private utility, we wouldn't still be constructing nuclear plants. We're a Government agency, and we have access to capital that allows us to continue construction. We're in the nuclear construction business because of our uniqueness as a Federal agency."

I ask, why does it make economic sense for TVA to continue with nuclear construction when it does not make economic sense for any other utility in the country?

A good example of this lack of accountability and management failures exists with the ongoing problems at the Watts Bar Nuclear Plant. Today, after 22 years of construction, Watts Bar is nearly \$9 billion over budget, and is yet to generate a single kilowatt of electricity. In 1988, TVA stood before this committee and stated that Watts Bar would be up and running within a year. Five years and billions of dollars later, TVA is before this committee again with the same message. Senior TVA management is still unable to accurately predict the cost expenditures and the completion schedules at Watts Bar year after year.

Over the past four years, the fuel load date has been delayed no less than six times. The projected cost of completion continues to skyrocket as the agency spends more than a million dollars a day at this plant. Still yet, there are conflicting reports about the present level of work still needed to be completed at this facility. A recent memo leaked to our organization summarizes the concerns of the senior NRC resident inspector at Watts Bar, stating that it may take two to five years—two to five years—to get Watts Bar on line.

As troubled a history as the Watts Bar plant has, TVA is now willing to bet the ranch, and I mean bet the ranch, that Unit One will get the NRC license and run better than any other nuclear, any of its other nuclear units. If TVA loses this gamble, the real losers will be the ratepayers of the Tennessee Valley.

There is a way out of this, across the country integrated resource plans have laid the foundation for good utility planning. TVERC recognizes that for the Tennessee Valley Authority, responsible integrated resource planning will be the cornerstone for the energy future of our region. Billions of dollars are yet to be spent by the agency. Key decision still remain to be made around TVA's nuclear power program, the potential for conservation efficiency, and the

development of renewable technologies and regional competitiveness.

One of the most important issues that must be addressed in embarking on this plan is uncertainty in two areas that TVA has been notoriously inaccurate in predicting, both future load growth forecast and nuclear power plan reliability. TVA's IRP should be the testing ground for continued investments in troubled and uncertain facilities like Unit One at Watts Bar.

Yet, TVA's senior management has convinced the TVA board that Watts Bar need not go through the IRP process. And I still don't think, even though what we heard today, that TVA is willing to put Watts Bar Unit One through the rigor of the IRP. They plan to have that plant completed, they claim, before the IRP is finished.

This is in direct contradiction to the plant's history. TVA's management argues that it will be finished. That is just not what has happened in the past.

In addition, TVA also views the Brown's Ferry Unit Three as a committed resource, even though this facility has not operated since 1985. We didn't get into that today, but that plant still has many, many NRC open items left before it will be finished. Unfortunately, the agency refuses to provide the documentation supporting the current cost projections and the schedules of these plants, nor the agency's alternatives, if these plants do not perform as predicted.

In short, TVA continues to ignore uncertainty in its energy planning. This has the potential to undermine the IRP process from the beginning.

TVERC also argues that as part of the IRP, TVA must solicit meaningful, and I do emphasize meaningful, public participation as a part of this effort. TVA has proposed the IRP review group. It remains unclear how this IRP review group will be constituted and what resources the body will have. I do not think that we still have a clarification on who is going to select the independent contractors that are going to be necessary to verify TVA's projections.

TVERC argues that independent analysis of TVA's fundamental assumptions must be available to the review group. This necessitates that TVA provide financial resources to the group so that they can seek analysis outside of the agency's institutional bias. And that is what is alive and well at TVA today, institutional bias.

Lastly, TVERC is concerned that TVA will de-emphasize the potential benefits gained from energy efficiency and renewable technologies in an effort to justify a one-dimensional approach to energy production, i.e., nuclear power.

Let me go on to the section on reform very briefly. As stated before, TVERC's mission is to reform TVA's current energy policies. Ultimately, TVA's energy plans must be based on acquiring the least costly, most environmentally sensitive mix of resources, including conservation of energy. A well-done IRP plan will serve as the foundation for building the least-cost framework in the energy policies.

But good planning can only take us so far. Ultimately, TVERC realizes that many problems experienced by the agency over time can be largely attributed to a lack of accountability to the citizens

of the Tennessee Valley. Decisions costing billions of dollars are made regularly without any system of checks and balances. Structural reform in TVA's decision making process must become a priority for Congress.

There are many models. We have heard Allan Pulsipher mention some today, and they would also include what's happened in the Pacific Northwest with a similar agency, Bonneville, with the Pacific Northwest Electric Power Planning and Conservation Act, which created the Northwest Planning Council. The 8 million citizens of the Tennessee Valley must have more of a voice and better representation in decisions affecting their future.

In closing, I would like to share a personal vision for the Tennessee Valley, a vision that returns to the roots of the TVA mission. The Tennessee Valley could be and should be this Nation's model utility, serving as a national and international laboratory for sustainable economic development in an environmentally sensitive region of the country. Combining the resources of the Department of Energy, Oak Ridge National Lab, The University of Tennessee, other regional universities, and our distributor community, TVA could be on the cutting edge of energy efficient services and technologies.

As a research and development lab, the agency would serve as an incubator for technologies that would eventually be implemented in our region and across the country. Today, we are only scratching the surface on the potential benefits of this important market. As this country's largest Federal utility, TVA could stimulate market development in clean, renewable energy technologies, thus creating more jobs, more sustainable economic growth, and less environmental degradation.

But most importantly, TVA will be doing the right thing, what is good for our region, our country and the world. And only then will TVA regain its place as a leader and an agency that we can all be proud of.

Thank you. I will field any questions.

Mr. CLEMENT. Thank you, Dr. Smith, very much.

Dr. Passerini, what do you think is a reasonable estimate of the electricity needs of the TVA service area over the next decade, and what steps would be needed from TVA to meet those needs?

Mr. PASSERINI. Approximately 25 kilomegs. That fluctuation is built into the various projections that I have made. A reasonable mix for that would probably include for the, let's say the next 20 years, a mix very similar to what we have now, that is, a majority coal. There is some possibility of additional hydro capacity, and a small amount of nuclear.

In other words, the 78-12-10 mix which we have now is probably appropriate. That, of course, could be met without either Watts Bar or Bellefonte, and in all probability, we ought to think seriously about taking down one or two units, probably Unit One and Unit Three, at Brown's Ferry, for economic reasons, Unit Three in the near future, and Unit One a little further in the future. That would provide us with an adequate amount of electricity and at the same time provide for the best economic mix.

At the same time, as I say, we should be doing a great deal with demand side management conservation and beginning to bring renewables into the market.

Mr. CLEMENT. Well, you know, you heard Dr. Cordaro a while ago in the previous panel mention about other types and forms of energy, other than nuclear, that would be much more economical and much less costly. Is that what you're proposing?

Mr. PASSERINI. Well, he was thinking, I think, primarily of gas-fired turbines for peaking, which would have been a brilliant decision for TVA back in the 1970s and even in the 1980s, and many of us urged them to do that, instead of continuing with the nuclear construction. At the moment, however, they are so far over on the nuclear that they probably should be very careful about peaking units.

We might think for example about pumped storage, which is cheaper than bringing on line gas-fired turbines for the next few years, if we want to meet peaking loads. Eventually, of course, gas-fired turbines will be an option, but I think that's 10 or 15 years down the road from an economic perspective.

Mr. CLEMENT. Dr. Smith, do you feel TVA is involving a representative cross-section of participants in the integrated resource planning?

Dr. SMITH. I wish I could answer that question, but unfortunately, it's indeterminate at this point. It's been very frustrating to have seen how slow the IRP process has been unfolding. I think that for those of us who have been intimately interested in watching its development, there really is not enough public information, we don't know yet. And I think that's unfortunate. Because as we recommend, which is included in the testimony, and as Dr. Hirst has said, TVA should be much further along in this process.

Now, I do want to commend Craven Crowell for stepping in and taking a serious look at it. I think he did the right thing.

He has involved more, or is taking a better look at the nuclear option as far as putting more plants, so-called "on the table." And I think he should be commended for that.

But the bottom line is that this the IRP has not been as high a priority within the agency as it should be. Because the IRP should lead the process, not the construction process leading the IRP. And I think that's where we're at right now.

Mr. CLEMENT. Are you also saying, Dr. Smith, that you would like TVA to not put so much emphasis on nuclear, and put a lot more emphasis on conservation and demand side management practices, customer cogeneration and construction peak load gas-powered turbine units?

Dr. SMITH. I think there's no doubt that that should happen. I think if you look, first of all, you've got to look at what's happening in other parts of the country. And I don't think that TVA is so unique that they should be getting away with continuing to go 180 degrees opposite of where every other utility in the country is going.

I think that one of the things that we heard today about Watts Bar being 99.9 percent finished or whatever, we've been hearing that for years. The question is not what we have put into the plant so far, but is what we have remaining to be put in the plant. And

our analysis of looking at this shows that we still have quite a ways to go. And with such a troubled history, that continued investment could become very significant.

If TVA keeps Watts Bar Unit One as a committed resource, not putting it through the rigorous analysis of the IRP, that money that they're committing to finishing that plant will foreclose other options, such as a combustion turbine type of facility. Because if we have \$1 billion yet to go in Watts Bar Unit One, and we were to invest that in a peaking combustion unit, what would happen is that we would get a unit that would run at a much higher capacity factor than any of TVA's nuclear units have ever run at, close to 95 percent. It will be there when we need it, and we can turn it off when we don't.

And TVA doesn't have a base load electrical problem. What they have is they have a peaking problem. And the reason is because they haven't done the proper planning.

So I think that what we need to do is encourage TVA to look at other options. There is no doubt in my mind that no new plant should come on line until we have fully done the analysis necessary in the IRP. And I think that TVA's unwillingness to involve Unit One at Watts Bar and Unit Three at Brown's Ferry though that undermines the process from the very beginning.

Mr. CLEMENT. This is for either one of you. Do you think TVA's load forecast of 2.3 percent annual growth over the next decade is designed to justify the construction and rehabilitation of nuclear units?

Mr. PASSERINI. Clearly. If you look at the projections, ever since the 1970s, that's what they've been solely designed to do.

Dr. SMITH. I think there would be no way that they would be able to get away with the vast expenditures they're planning to if they couldn't have a load forecast that they predict consistently. Because it's so outrageous and so—but the problem is that they've never grown like that before. I mean, it's not accurate. And that's the bottom line. This constant refusal to look at the history of what's gone on there by TVA I think is unacceptable. They need to really look at what's going on. They're not getting it right. They're not getting the plants reliable.

I think that you should really question about these capacity factors they told you. Sequoia has not run at 50 percent, and Brown's Ferry has not been running above 50 percent if you look at the whole plant as a base. And that kind of analysis needs to be done, and that information needs to be rectified. I do not agree with the capacity factors above 50 percent that were stated earlier today.

Mr. PASSERINI. Well, those capacity factors were simply wrong, because they had used trumped-up data. They eliminated 1985 to 1989 in using them. But notice that their factual growth has been about 1 percent per year for the last 20 years and that included some very boom times. So to look at 2.3 percent or whatever today is absurd.

Mr. CLEMENT. Congressman Duncan.

Mr. DUNCAN. Dr. Passerini, you said if TVA was servicing its debt as it should be there would have to be very sharp increases in the rates. What specifically do you mean by that?

Mr. PASSERINI. Servicing it to the extent of beginning to address it and bring it down. If you are making payments at the rate that would begin, even at a very slow rate, to bring that debt down, then clearly the only other place to get that money would either be through efficiency with DSM, which they're not practicing, or through raising rates.

Mr. DUNCAN. Well, how much of a rate increase are you talking about?

Mr. PASSERINI. Well, I think TVA has gotten itself between a rock and a hard place, and so for them, they have to make a very careful decision about at what rate they can raise rates, or they're going to lose Knoxville and Nashville and so on.

Mr. DUNCAN. That's the problem, isn't it, they are between a rock and a hard place. I'm not trying to defend this in any way, I don't want you to misunderstand that. Because I think it is very unfortunate and very troublesome to me that there's an agency of this size that would have the kind of debt that it does.

But I mentioned earlier this morning that there have been already threats by Memphis to pull out and Bristol, Virginia. And if they raise their rates very much, they're going to possibly lose even other customers.

Mr. PASSERINI. Agreed.

Mr. DUNCAN. So they really can't raise rates significantly, can they?

Mr. PASSERINI. Then the only other option is aggressive demand side management and trying to bring on line the most efficient units possible.

Mr. DUNCAN. And what specifically does that mean, aggressive demand side management? Do you mean restrictions on power usage by the customers of the TVA?

Mr. PASSERINI. Oh, no, not at all. What I mean is the most efficient use of electricity in the area, and bringing in industries which can generate a great deal of economic output for the Valley, using as little electricity as possible. In other words, you're using more electricity, but you're using it much more efficiently. That's a part of what you do when you do demand side.

Mr. DUNCAN. Well, let me ask you this. You're an expert on this and I'm not. The methodology that you use, or that you advocate for load forecasting, I assume, are there other—is this specific method used by a lot of other utilities around the country?

Mr. PASSERINI. Very similar methods. I'm sure everybody uses a slightly different method. But it really doesn't matter much what methodology you use. I hope you use, and most utilities do, something sophisticated enough so that it takes into account most of the variables.

My point about TVA is that they don't do this sort of thing. If you look at the 10 points at the end of the paper that I gave you, you see that they do in fact exactly the opposite. They looked, for example, at single family housing versus multi-family dwelling, and came to the exact opposite conclusion from what was happening in the Valley. And that sort of thing, of course, will drive a 2.3 percent or whatever you like as opposed to the reality.

Mr. DUNCAN. I'm not going to have time, because of votes, to ask all the questions that I would like. But Dr. Smith, let me ask you

a couple of questions. Now, TVA has supplied us with statistics or information that say that they have spent \$6.1 billion total, over all time, on Watts Bar One, and \$1.6 billion on Watts Bar Two. That adds up to \$7.7 billion.

Yet in your testimony, you say that the Watts Bar facility has run more than \$9 billion over budget. And I'm wondering, what is the difference there, or what is the discrepancy? Because \$9 billion over budget, and I don't know what the original—

Dr. SMITH. The original was, it was about \$300 million.

Mr. DUNCAN. Three hundred million?

Dr. SMITH. Right. And I guess what we're looking at is, we don't know exactly all the costs that are factored into the Watts Bar Facility. There have been reports of costs being spilled over between units and things like that. But the bottom line, the way we come to our numbers, or what is it going to take for them to finish. And they are rapidly approaching \$9 billion to finish that plant.

Mr. DUNCAN. Well, they say it would take \$500 million to finish.

Dr. SMITH. But I think again, you've got to look at, they were here before this committee five years ago with very similar cost projections, and we will provide for the record how they have repeatedly said "We're going to do it in six months, and we're going to do it for half a billion dollars. We're going to do it in six months, we'll do it for half a billion dollars." And they have not been able to do that.

Mr. DUNCAN. Let me ask this. You seem to be pretty certain in your testimony that TVA is not going to get a license from NRC to operate Watts Bar One. Why do you feel that way? Why do you feel so certain about that?

Dr. SMITH. I'm not saying that the NRC will not give TVA the license to operate Watts Bar, although it still is in question. What I am saying is that NRC will not give TVA a license to operate Watts Bar in the schedule that TVA is presenting to you today. It will not happen this year, and I question seriously whether it will happen in the early part of 1995.

And I think that we will see that time will bear this out. Unfortunately, that's the way it's been in the past.

Mr. PASSERINI. May I quickly address that?

Mr. DUNCAN. Yes.

Mr. PASSERINI. The NRC, which in the past has been very lenient with TVA, is getting a bit upset with TVA, not only because of the opacity that I mentioned earlier, but from all kinds of attitudes.

One anecdote happened a couple of months ago, at Sequoia, the plant that they're so proud of. An air handling system with filters, the NRC asked TVA to check their filters to make sure that no radioactive particles were getting through. TVA found it difficult to check the filters, and so persuaded the NRC that instead of checking the filters, it would be safe to simply remove the filters, which they did.

And now, that air handling system, which exhausts to the top of the auxiliary building, is hot; we've got blazing hot cations up on that roof. Cations, positive particles, jump. So every pigeon that comes by picks up that stuff, wind picks it up. We don't know quite

what's going to happen. Everybody at TVA is holding their breath wondering how the NRC is going to jump on that one.

I think the NRC is going to jump on not only that but all kinds of bad decisions that are going on at TVA currently like that.

Dr. SMITH. I don't think that you could pin anybody down at the NRC that will give you any level of confidence in Watts Bar schedule. I've come up here and met with people at the NRC in Rockville, and they are not at all confident with TVA's schedule, even Ellis Merschoff, that testified today, it was predicting slippages. I think that is very consistent with what has happened.

Mr. DUNCAN. Well, let me say this. I think it's ridiculous that they have had the cost overruns that they've had, and I don't know anybody who would say differently. On the other hand, you have this testimony from Chairman Crowell, and it says at the time, talking about 1974, TVA projections included requests by the Federal Government to provide power for two uranium enrichment plants that would require the equivalent output of two nuclear units alone. That was a request from other parts of the Federal Government.

Then he goes on and he says the heyday of nuclear power came to an end in the late 1970s as electric utilities got caught in a triple bind. First the oil embargoes sent the price of oil and other energy sources through the roof, then runaway inflation pushed construction and financing costs in the same direction, then finally Three Mile Island caused the industry and its regulators to rethink nuclear power in this country. And it says the demand for electricity fell flat as a result of the energy crises and so forth.

I guess what I'm saying is, that while this is a terrible problem, I think everybody agrees with that, and everybody's done a great job pointing out what the problem is, and I think that's good that we've all pointed out these problems, but now we had better talk about the future, I suppose, and where we go from here.

Dr. SMITH. That's exactly it, where do we go from here? That's the big question.

Mr. DUNCAN. You know, I think it is really sad that environmental extremists in this country have caused us these tremendous billions of dollars of expenses on these nuclear plants and kept them from going on line and kept us from having a cost-effective nuclear program in this country, as it has been so beneficial to other countries around the rest of the world.

Now, be that as it may, most of these units have been cancelled now. And I don't know that, I don't know that we can invest all this money and just let it go down the drain.

Mr. PASSERINI. Mr. Duncan—

Mr. DUNCAN. We've got to go vote, so—

Dr. SMITH. Well, I think the Three Mile Island incident is not an example of environmental extremism. I mean, that is an example of what happened. The NRC has implemented good policy to try to make the plants operate more safely. So I think those types of things happening are important to make sure that we have a safe, reliable source of electricity.

Mr. PASSERINI. TVA requested the Federal Government for those plants for uranium enrichment.

Mr. DUNCAN. Well, I apologize to you, but we're going to miss the vote if we don't leave right now. Thank you very much.

Mr. CLEMENT. I want to thank all those that have testified. I appreciate all of you that have attended the hearing and participated. It's been a very interesting hearing, very informed hearing, and surely this won't be our last hearing as well on these most important issues concerning TVA and our country and the future availability as well as the price of energy, and to assure that we remain competitive for the future.

Dr. SMITH. Well, Mr. Clement, I want to take a moment to personally thank you for taking the leadership on this and making sure that this hearing happened. I've been impressed with the questioning, and I hope that we will continue, and this will just be the beginning of a process of working on reforming TVA.

Mr. CLEMENT. Thank you, Dr. Smith. Thank you all.

[Whereupon, at 3:52 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

PREPARED STATEMENTS
SUBMITTED BY WITNESSES

*M. C. Cordaro, President
Nashville Electric Service*

My name is Matthew C. Cordaro and I am the President and CEO of Nashville Electric Service. Prior to joining NES in June of 1993, I was President of Long Lake Cogeneration Corporation, an independent power company. Before that I was with the Long Island Lighting Company for 22 years, where my last position was Senior Vice President of Operations, Engineering and Construction.

I have a Bachelor of Science degree in engineering science, a Master of Science degree in nuclear engineering and a Doctorate in engineering and physics. I have also been an Atomic Energy Commission Fellow, a guest research associate at Brookhaven National Laboratory and an adjunct on the engineering faculty of Polytechnic Institute of New York and C.W. Post College.

Nashville Electric Service was established In 1939 when the city of Nashville purchased the property of the Tennessee Electric Power Company. NES is owned by the Metropolitan Government and operated by a five member board appointed by the mayor and confirmed by the Metropolitan County Council.

*M. C. Cordaro, President
Nashville Electric Service*

NES does not own or operate any generating capacity and is one of TVA's largest distributors. In terms of number of customers served, we are the ninth largest public electric utility in the United States.

We have just under 1000 employees serving approximately 280,000 customers; over 31,000 of those commercial accounts.

I want to open by stating that none of my comments today should be taken as criticism of the current management at TVA. In fact, I think quite highly of the new Board and strongly support the recently announced reorganization that segregates nuclear functions from other aspects of TVA's operations.

The new structure is very similar to that employed by some of the very successful private utilities who have found that such a separation is essential. Without it the demands of operating nuclear power plants can drain resources and overshadow the absolute necessity of a clear focus on customer issues.

I commend Chairman Crowell and the rest of the TVA Board for recognizing this, and acting promptly to implement the changes.

*M. C. Condaro, President
Nashville Electric Service*

I also recognize, and am grateful for, their heightened sensitivity to the business issues that we are all facing.

I also want to make it clear that I am not here to play Monday morning quarterback and criticize past administrations. Changes in the economic and political climate do not invalidate decisions that were prudent for the conditions at the time they were made.

TVA has served the Tennessee Valley and the United States well for some time, and has provided economic and societal benefits far beyond original expectations.

But we cannot live in the past, and the future we face today is at least as challenging, if not more difficult. There is also enormous opportunity in the future if we combine the advantages of public power with the best attributes of private industry.

Like the most successful private companies, we, the public utilities, must develop well thought out competitive strategies, cultivate a sense of urgency and tension, implement better management systems, become innovative, and above

*M. C. Cordaro, President
Nashville Electric Service*

all be willing to take measured risks. To accomplish this, however, we will need an equivalent level of flexibility and forward thinking from our supplier of bulk power in the Tennessee Valley, TVA.

Having spent nearly thirty years in various aspects of the energy business, I feel that I know well the risks involved in pursuing an extensive nuclear power program. I have also lived through one of the most tragic episodes of the nuclear era, the construction, licensing and death of a major nuclear power station.

When I talk about nuclear risk, I want to make it perfectly clear that it is business risk – not health and safety – that I am referring to. I remain strongly convinced that nuclear power is a safe and environmentally compatible method of generating electric energy. In fact, nuclear generated electricity may play an essential role in meeting the requirements of the Clean Air Act Amendments.

But having said that, I must add that current political and social obstacles may make the cost of additional nuclear power plants unacceptable in an era when we must learn to be competitive. In fact, I believe that there must be serious debate about the construction of any large centralized power generation.

*M. C. Cordaro, President
Nashville Electric Service*

I urge TVA to carefully balance its ambitious nuclear program against the potential benefits of meeting future needs for power through dispersed, smaller generating units. For example, natural gas-fired combined cycle units with a five year planning horizon can be brought on line in three or four years at a fraction of the cost per megawatt of nuclear generation. They utilize an environmentally compatible fuel and their capacity can be readily expanded in a modular fashion to accommodate increasing demand.

Planning assumptions are just that, assumptions. The shorter the time frame, the more reliable they are and the more flexibility you have in meeting energy demands. When the planning horizon is extended out over a decade, as in the case of nuclear plants, the crystal ball gets very cloudy. The result is that billions of dollars are committed to address a future scenario which cannot be predicted with an acceptable level of confidence.

In addition to gas-fired combined cycle generation, TVA should keep in mind in its future planning new methods of generation using renewable resources, and cost effective demand side management and energy conservation programs. With respect to the latter, the notion of cost effectiveness cannot be overemphasized. Acceptable DSM and conservation programs must be able to

*M. C. Conlato, President
Nashville Electric Service*

stand on their own economically, and be paid for by those directly receiving the benefits.

In conclusion, I think we recognize that we must go beyond our traditional utility role of supplying safe and reliable electric power and be our customers' partners if they, and we, are to succeed in coming years. Equally, TVA has to recognize us a partner – be innovative, flexible, and customer focused. The benefit will be that together we can add value for the future instead of being a cost of doing business.

SUBMITTED TESTIMONY OF CRAVEN CROWELL, CHAIRMAN
TENNESSEE VALLEY AUTHORITY
TO THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
U.S. HOUSE OF REPRESENTATIVES
MARCH 9, 1994 WASHINGTON, D.C.

Eight months ago, my Board Colleague, Johnny Hayes, and I were sworn in as new members of the TVA Board and I was appointed as Chairman.

We are grateful for the confidence that President Clinton and the United States Senate expressed in us.

We joined Bill Kennoy . . . who has served on the board for three years . . . to form a new board for TVA.

More than eight million people depend on the electric power TVA produces to keep their homes comfortable and safe and their businesses operating.

Millions of people use the 650-mile Tennessee River and its tributaries for recreation and commerce.

When everything is right, people can take their electric power---and our river system---for granted.

When our systems are tested, as they have been by recent storms, we're reminded just how important it is that we pour every ounce of energy and imagination into keeping the power flowing and the rivers regulated.

Congressman Clement, as a former TVA board member, understands how this commitment affects the lives of people throughout the Tennessee Valley region.

After I was sworn in as chairman in July, the Board set forth Phase One of our long-term plans for TVA, in the form of a five-point leadership plan for our first six months in office.

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In that initial phase we wanted to

- 1- Reorient ourselves to the problems and concerns of TVA employees and customers,
- 2- Set strategic goals,
- 3- Monitor and report on those goals,
- 4- Hire a chief operating officer, and
- 5- Restructure TVA for the future.

Johnny Hayes and I undertook a two-month orientation program. We wanted to see and hear firsthand from our customers, our employees and community leaders throughout the region.

We heard loud and clear

- that our rates are important and should be kept stable,
- that our environment is important and should be protected,
- and that TVA was putting contractors first and employees second.

We heard these messages over and over.

In September, the TVA Board and top executives developed three strategic goals:

- to maintain competitive electric rates,
- to make TVA an environmental leader,
- and to put our people first.

More specifically, we committed to not raising rates for four more years. That would mean going a decade without increasing our overall revenues through a general rate hike.

Having stable, competitive rates for electricity is the single most important thing we can do for everyone in the Valley.

From people on fixed incomes . . . to small business owners . . . to those running hospitals and schools . . . our rates make a difference.

Stable rates are just as important for industrial growth and job creation.

In the Tennessee Valley . . . our annual growth in manufacturing production is more than twice the national average.

And manufacturing employment in our region is on the upswing . . . while it continues to decline in the nation as a whole.

In fact . . . since TVA froze its rates in July of 1988 . . . more than 4,500 industries have announced plans to begin or expand operations in the Tennessee Valley.

That represents an investment of \$19.2 billion . . . and the creation of more than 200,000 jobs.

Of course . . . TVA can't take credit for every new dollar invested or job created . . . but abundant, low-cost energy is an essential ingredient for strong, sustained economic growth.

To keep our rates competitive . . . we have focused on the needs of our customers. We have cut bureaucracy and red tape. And we have adopted the standards of Total Quality Management.

Many of these steps . . . Mr. Chairman . . . now place TVA at the forefront of reinventing government.

The results for TVA are clear. We have cut labor and operating costs more than \$200 million a year. . . and our interest expenses by \$270 million a year.

Our second strategic goal is to make TVA an environmental leader. To achieve this goal we've developed four major initiatives:

First, we're creating a national environmental research center at our facilities in Muscle Shoals, Alabama . . . where environmental scientists will develop and study new ways to prevent, control and mitigate pollution.

Second, we're developing a comprehensive plan for the environmental management of our region's resources.

Third, we're creating an Environmental Advisory Council of regional and national experts . . . who will have input on everything we do.

And fourth, we're making environmental leadership part of everyone's job at TVA.

Which brings me to TVA's third strategic objective . . . to put our people first.

This goal recognizes that employees are TVA's most valuable assets.

They're the key to reducing our costs and improving our efficiency . . . so TVA can achieve its goal for a decade of stable rates.

And employees are the foundation of our efforts to improve environmental awareness . . . so TVA can be an environmental leader in everything it does.

To put employees first, we have adopted a contracting policy everyone can understand and use.

We are reviewing workforce plans and determining where skills are needed in the future and what can be done to provide training to meet those skill needs.

And we are establishing a process of providing 360-degree feedback for management at TVA.

We believe that these goals will take TVA to the doorstep of the 21st century as a competitive power system.

We will be a responsible environmental neighbor, and an agency whose employees feel ownership in the direction and performance of their company.

We've shared these strategic goals with our employees. We're monitoring our process on each goal and reporting regularly to our employees.

After we set our strategic goals, we restructured TVA to focus its efforts on accomplishing those goals and ensuring our future success.

We appointed a Chief Operating Officer to take care of our daily operations and make sure we meet our strategic goals.

We named a Chief Administrative Officer to make sure our corporate functions are organized and carried out efficiently.

We've put in place a Chief Nuclear Officer so that we can focus more attention on our nuclear operations.

And we've announced the appointment of a Senior Nuclear Advisor to work directly with the board on nuclear matters.

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We're confident in the organization we have in place and the direction we have set for TVA.

Our confidence was bolstered recently as TVA met several crucial tests.

During a period of record cold and record demand for electricity, TVA employees worked around the clock to meet that demand.

And when a period of record rainfall brought our region to the brink of a major flood, our system of dams successfully protected the lives and property of those living along the river.

TVA is operating well, and it's meeting challenges, both natural and man-made.

Before I cover TVA's current programs, I will summarize TVA's past and the mission it has been called to serve.

When TVA was established by the U.S. Congress in 1933, it had three principal missions:

- To control the floods that routinely devastated the Tennessee Valley.
- To improve navigation along the Tennessee, which is the nation's fifth-largest river system.
- And to produce electric power for the Tennessee Valley region.

Our power system now includes some 80,000 square miles in the southeastern United States, including most of the state of Tennessee and parts of Alabama, Mississippi, Kentucky, North Carolina and Georgia.

Today, TVA's electric-power generating plants include coal-fired plants, nuclear plants, hydroelectric dams, combustion-turbine plants, and a pumped-storage plant.

In 1993 TVA's coal plants produced 76 percent of TVA's electricity. Nuclear plants generated 9 percent, and hydroelectric plants 15 percent.

In 1993 TVA sold 118 billion kilowatt-hours of electricity---more than enough power for three cities the size of New York.

TVA provides this electric power to 160 local municipal and cooperative power distributors through a network, or grid of about 17,000 miles of transmission lines.

These local power distributors deliver electricity to homes, businesses, and industries in the seven-state TVA service area.

TVA also sells power directly to some large industries and federal agencies.

TVA's power system uses no tax dollars.

Other programs---including flood control, navigation, lake management, environmental initiatives and programs for the agricultural and economic development of our region---are funded by Congress.

And, again, I would like to thank Congressman Clement for his role in assisting TVA in that regard.

At TVA, we are looking toward the future by preparing a long-term energy strategy called the Integrated Resource Plan, or IRP.

The IRP represents Phase II of the Board's direction for meeting the challenges of the 21st century.

The process was started in January, and it will take between 18 months and two years to complete.

When we are done, the IRP will provide a 25-year energy strategy for TVA.

It will be the Board's blueprint for TVA's power future.

It will focus on our power plants . . . our conservation and demand-side management programs . . . new technologies for meeting future power needs . . . and how we can meet those needs more competitively.

The Board will have weekly briefings on all aspects of IRP planning. . . from short-term power considerations to load forecasting into the next century.

All major stakeholders will have an opportunity to become involved in the IRP process. We will hold open meetings to hear from the general public, and outside experts have already been consulted.

We are also assembling an IRP review group.

This group will include representatives of TVA power distributors, direct-served industrial customers, state agencies. . . and members of the environmental community.

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The Review Group will meet monthly to assist in the planning process and will report its recommendations directly to the Board.

The challenge facing the TVA Board will be to take all the information gathered and decide the most efficient and appropriate balance between the energy that will be needed and how TVA will most efficiently supply it.

Before I discuss the decisions this Board has faced, I will, as requested, summarize the history of TVA's nuclear program

TVA began planning its first nuclear plant in 1966 and construction started at our Browns Ferry Nuclear Plant in Northern Alabama in 1967.

Two years later . . . in 1969 . . . construction began on our second nuclear plant, the Sequoyah Nuclear Plant in Southeastern Tennessee.

Our first commercial power came from Unit One at Browns Ferry in 1974. Power came from Browns Ferry Unit Two in 1975 and Unit Three in 1977.

During these same years when TVA was producing its first nuclear power . . . the demand for electricity was increasing at seven percent a year nationwide . . . or doubling every 10 years.

The environmental consequences of coal were becoming clear . . . and large electric utilities across the country turned to nuclear power as did TVA.

By 1974 . . . TVA had approved plans for 17 nuclear units at seven different plant sites. This amounted to one of the most ambitious nuclear construction plans in the nation.

At the time . . . TVA projections included requests by the federal government to provide power for two uranium enrichment plants that would require the equivalent output of two nuclear units alone.

The heyday of nuclear power came to an end in the late 1970s as electric utilities got caught in a triple bind.

First . . . the Oil Embargoes sent the price of oil and other energy sources through the roof. Then . . . runaway inflation pushed construction and financing costs in the same direction.

And finally . . . Three Mile Island caused the industry and its regulators to rethink nuclear power in this country.

The demand for electricity fell flat as a result of the energy crises . . . and nationwide more than a hundred units that were once planned fell victim to changing times.

A number of large coal-fired plants were also cancelled at this time.

TVA . . . like every electric utility with a nuclear program . . . began to cut its construction program as uncertainty grew about the need for large blocks of additional power.

Eventually eight of 17 planned nuclear units were cancelled.

By 1982, TVA had two units operating at Sequoyah and three units at Browns Ferry.

Four units remained under construction. Two at the Watts Bar site in East Tennessee and two at the Bellefonte site in north Alabama.

The Sequoyah and Browns Ferry units performed well until the program began losing experienced managers to higher-paying private utilities.

In 1984 and '85, the Sequoyah and Browns Ferry units were taken out of service to strengthen the management system and make safety upgrades that had fallen behind schedule.

The shutdown led TVA to implement a large-scale effort to identify, correct and resolve problems in the nuclear program.

It was a long and necessary process. Today, we are confident that our nuclear operations are being managed with safety as the top priority.

The program is operating under close supervision, and we have re-established a good relationship with the Nuclear Regulatory Commission.

But this Board will have to make some important decisions regarding TVA's nuclear units.

When I returned to TVA eight months ago, we had five licensed nuclear units . . . two at Sequoyah Nuclear Plant and three at Browns Ferry Nuclear Plant in Northern Alabama.

Only one of those, Browns Ferry Unit 2, was on line and generating power.

Since then we have returned one unit at Sequoyah to service, and we expect to restart the other soon.

In addition to the units already licensed . . . two units at Watts Bar Nuclear Plant were under construction and two units were planned at Bellefonte Nuclear Plant.

We faced an immediate decision about Unit 1 at Watts Bar: Should we finish the unit or defer it?

This facility is 99 percent complete. We could finish the plant and put it into operation for \$500 to \$550 million. Or we could include this particular unit in our IRP and see if it would be needed for the future.

Based on current demand expectations . . . we believed it would be needed.

And when we learned that it would cost more in interest charges to delay the decision 18 months to two years than it would cost to complete the plant, we decided the best thing would be to finish the job.

This would allow us to gain some revenue from the investment already made in Watts Bar.

One of the most significant decisions this Board has made is to take a hard look at the four nuclear units that are the farthest away from completion.

Ultimately, this Board must decide what to do about Watts Bar Unit 2, Browns Ferry Unit 1, and the two units at Bellefonte.

The estimated costs for finishing each of those units is between \$1.1 and \$1.3 billion for Watts Bar 2, at least \$850 million for Browns Ferry 1 and a total of between \$3 and \$3.5 billion for two units at Bellefonte.

As we make those decisions, we will ask the hard questions:

- Are those units needed?
- Are they worth the cost of construction or refurbishing?
- Would it be better to convert these units to another fuel source?
- Would those units serve to lower TVA's rates and make TVA more competitive?

We understand that the level of TVA's investment in our power system is important to this committee.

TVA carries a debt of \$25.25 billion dollars.

\$21.75 billion of this debt is in long-term bonds.

\$3.5 billion is in short-term bonds.

In addition to this, TVA has another \$4.5 billion of defeased debt, which doesn't count toward TVA's overall debt limitation.

We intend to control our debt in the future and to make sure there's a good balance between our overall need for capital and the need to keep current rates competitive.

In the coming years, TVA projects that its capital spending will exceed its revenues by an average of about \$650 million a year.

Under these estimates, TVA will not need to exceed its current loan limitation of \$30 billion until the beginning of the next century.

TVA is a financially sound corporation, and it's consistently rated triple-A by financial experts who guide investors across the country.

The reason we've been able to refinance a large portion of our debt is that utility investors . . . the people who evaluate utilities for a living . . . have great confidence in what we are doing.

In two separate bond offerings since last July, TVA has offered a total of \$1.2 billion in 50-year bonds on the public markets.

In both of these offerings, our bonds sold very quickly, and the brokers on Wall Street were requesting more.

These quick sales show that America's investment community judges TVA's long-term financial prospects to be excellent.

TVA, like all utilities, is operating in a new world of competition.

Low rates and high-quality service will be the only way to survive.

One of the most effective measures we've undertaken to cut our costs has been to refinance \$18.4 billion of existing debt at lower interest rates.

There is one chunk of TVA's debt, though, that we have been unable to refinance, some \$6 billion in noncallable debt with the Federal Financing Bank.

It's not because we haven't tried.

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We have been discussing this proposal with the Department of the Treasury, and we believe they have the authority to allow us to refinance this debt.

But we have not reached a resolution.

If we were able to refinance . . . we could cut our annual interest payments by anywhere from \$100 to \$140 million, depending on interest rates at the time of refinancing.

Since TVA exists to benefit the people it serves, we would be able to pass these savings along to our customers, or use these funds for needed capital projects.

Congressman Clement comes from the Valley, and he knows the importance of TVA. And as a former TVA Board member he understands how TVA's rates affect those on fixed incomes and those working to keep a small business going.

Our commitment to stable rates is essential to our competitiveness . . . to the competitiveness of our customers . . . and to the economic well-being of everyone in the Tennessee Valley.

Low rates . . . high quality . . . strength and flexibility . . . and the adherence to good planning will be the cornerstones of success in the 21st century.

My term on the TVA Board extends into that century, and I am deeply aware of how the decisions we make today will affect people tomorrow.

Our responsibility to the future is a stewardship that none of us on this Board takes lightly.

We appreciate the opportunity to address this committee . . . to inform you of the progress we're making at TVA . . . and to ask for your help with our efforts to keep TVA as competitive as possible.

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**Statement of the
Tennessee Valley Public Power Association**

**Concerning the Power Program of the
Tennessee Valley Authority**

**By
Sam A. Head, Jr., Chairman
TVPPA Power Supply Planning Committee**

**To The
United States House of Representatives
Committee on Public Works and Transportation
Subcommittee on Investigation and Oversight**

March 9, 1994

**Tennessee Valley Public Power Association
1201 Chestnut Street
Chattanooga, Tennessee 37402
(615) 756-6511**

Mr. Chairman and members of the Committee. My name is Sam A. Head, Jr. I am a resident of Columbus, Mississippi, where I serve as General Manager of the City of Columbus Light and Water, a municipally-owned electric system which purchases its power at wholesale from the Tennessee Valley Authority (TVA). Before I joined Columbus Light and Water, I served as manager of the Cullman Rural Electric Cooperative in Cullman, Alabama, which also purchases its wholesale power from TVA; and before that, I was employed by the Memphis Light, Gas and Water Division, TVA's largest wholesale power customer.

Today I am here in my capacity as Chairman of the Power Supply Planning Committee of the Tennessee Valley Public Power Association (TVPPA).

TVPPA is the regional service organization representing the interests of 110 municipal electric systems and 50 rural electric cooperatives that purchase wholesale electric power from TVA, providing approximately 85 percent of TVA's power system revenues. These 160 electric utilities resell the electric power on a nonprofit basis for the use of some eight million people who live in the Tennessee Valley region, which includes most of Tennessee, northeastern Mississippi, northern Alabama, southwestern Kentucky, and small portions of Georgia, North Carolina and Virginia.

We appreciate the opportunity to appear before this Committee for we all have a significant interest in TVA's present operations and its future.

Following the passage of the TVA Act in 1933, the municipal electric system of Tupelo, Mississippi became the first electric utility to purchase wholesale power from TVA in 1934. Since then, numerous municipal electric systems and electric cooperatives have become a part of the TVA system until reaching the present total of 160.

Almost 35 years ago, TVA's power program became self supporting from revenues it produces. However, there continue to be those who believe that TVA is a federally subsidized

utility. That is not the case. Perhaps that misunderstanding arises from the fact that TVA not only has a power program, but TVA also has nonpower activities that are indeed funded through Congressional appropriations. Those appropriated funds are used for purposes consistent with the TVA Act that imposes upon TVA obligations for flood control, industrial and agricultural development, improved forestry in the TVA region, and other development purposes.

Contrary to some assertions that the power program is federally subsidized, the power program, in fact, pays annual dividends to the U.S. Treasury to repay the federal government's initial investment in TVA's power system. In 1993, TVA paid \$48 million as a dividend to the U.S. Treasury as a return on the federal government's initial investment. In addition, TVA repaid the U.S. Treasury \$20 million toward the appropriations invested in the power program years ago. These payments are based on the average current interest of the total U.S. Treasury marketable obligations. Under the 1959 amendments to the TVA Act, the federal government's earlier appropriations allocated to the TVA power program are being repaid in full from power program revenues along with payment of the annual dividends to the U.S. Treasury.

For these reasons, TVA is not just another utility, nor is it just a producer of power to serve the citizens of the TVA region. And while TVPPA members support TVA's nonpower programs, economic development in the TVA region during the past sixty years or so has required TVA to expand the power program to serve the electric power demand in the region to the extent that the power program now dwarfs the nonpower programs.

TVA's power program, of which TVPPA is proud to be an important part, has grown in large part because the federal government provided TVA and our eight million Valley residents with the resources necessary to promote human and economic development. TVA's agricultural development program took a region beset by erosion and subsistence farming and

helped it develop into a modern farm economy that could take advantage of the agricultural tools that electricity could power. TVA's economic development programs fueled business and industrial growth that could profitably use electricity made available by the power program. TVA's agricultural, natural resource, and economic development programs have been and continue to be essential complements to the availability of abundant electric power.

Through various mechanisms, Valley consumers have a role in choosing governing boards of all of the 160 electric utilities which distribute TVA power. With the exception of a few large industrial customers and a number of governmental customers served directly by TVA, the remaining residential and commercial consumers of TVA-generated power are served directly by the TVPPA members. We believe there is no other organization that is as truly representative of the interests of the citizens of the TVA region as is TVPPA. We have daily contact with the electric consumers, and we are in a position to be of substantial help in forming TVA operating policies.

TVPPA members are principally involved in TVA's power program, which is supported entirely by revenues from the sale of electricity. TVPPA members individually and collectively negotiate on a regular basis with TVA on matters of rate structure and other aspects of TVA power system operations. This regular rate and service negotiation process between TVPPA members and TVA is an effective method of assuring citizen input into TVA operations. Because of our obligation to serve the interests of all of our citizens, we have no agenda targeted to any special interests. Our obligation to serve those citizens is one that runs to all of them regardless of whether they are rich or poor, urban or rural, educated or unlettered, business or residential, of all races and from all walks of life. For these and other reasons, we are vitally interested in TVA's long-term goals and plans.

TVA and the TVPPA members work together on numerous matters other than the

power program, and particularly in the area of economic development. These close relationships put us in a difficult position. On the one hand we are strong TVA supporters in both its power and nonpower programs. However, we have obligations to the citizens we serve to see that they have a source of reliable electric power at the lowest feasible cost. It is only in recent years that the potential for conflict between these obligations have caused the relationship we have with TVA to be examined with greater care.

Years ago there was no other source of electric power in the southeast available at a cost as low as that from TVA. Even though TVA has maintained rates at a constant level since 1988 and the cost of TVA power is more competitive today than it was then, there are now other sources of power that might be available to some TVPPA members. With open access to transmission now available throughout the United States, and with the mandates of the Energy Policy Act of 1992, TVPPA members now must analyze other possible sources of power. We now must take an active and vigorous role in analyzing TVA's nuclear program which requires an assessment of TVA's load forecasting procedures. When one speaks of TVA's increasing debt burden, one must consider that this debt will have to be serviced for the most part by our ratepayers. The destinies of TVA and the TVPPA members are so intertwined that we cannot and will not ignore either the internal or external factors that bear upon TVA's ability to compete with the other electric utilities that surround the TVA region.

The TVPPA members believe that we are important partners with TVA in efforts within the Valley to develop a better standard of living for our citizens. Yet, as TVA will quickly tell you, we are not silent partners. If we believe TVA is not acting in the best interest of all ratepayers and all citizens, we will be among the first to bring our views to TVA's attention. We are vocal and insistent, and will continue to be as our Power Supply Planning Committee deals with these issues facing the TVA region.

We are philosophically in agreement with the purposes of the TVA Act and do our part by distributing electric power locally on a nonprofit basis to the consumer. However, because of the contractual relationship between TVA and TVPPA members, we and the citizens we serve have a substantial financial interest in TVA's future. If TVA makes a mistake, we must pay 85 percent of the costs which must be passed through to those citizens served by TVPPA members. One hundred fifty-five TVPPA members have signed sole source of supply power contracts with TVA that provide for cancellation upon ten years' notice. Of the remaining five, one, Bristol, Virginia, Utilities, had previously given TVA notice of its intention not to renew its contract. However, we understand that negotiations between TVA and Bristol, Virginia, recently resulted in an agreement in principle for Bristol to continue purchasing TVA power. One other, a rural electric cooperative in Mississippi, has given its notice under termination provisions of its ten-year contract with TVA. This action may be symptomatic of a concern many of us have as to whether or in what manner there should be a continuing relationship with TVA. The primary basis for that concern appears to be whether TVA can be a competitive producer of electric power.

TVPPA's Power Supply Planning Committee was formed after passage of the Energy Policy Act of 1992, before TVA announced its process for integrated resource planning, and before your Subcommittee announced it would conduct these hearings. This is, however, an ideal time to explain what TVPPA's Power Supply Planning Committee will do and how that relates to TVA's integrated resource planning.

The TVPPA Power Supply Planning Committee will conduct studies and analyze the alternatives available to TVA and TVPPA members for sources of power. The least-cost planning process mandated for TVA and TVPPA members under the Energy Policy Act of 1992 is indeed an appropriate mechanism for examining how TVA will meet its near-term and

long-term obligations to provide an economical supply of reliable electric power in an environmentally sensitive manner.

TVA has informed TVPPA that a citizens review group will be formed to advise TVA as it develops its integrated resource plan. We understand that review group will be broadly representative of TVA constituents, and will include some TVPPA members. That process, we believe, will be a healthy exercise and we hope that it will help provide the best information to the TVA Board to make the hard decisions required to meet the future power supply needs of the region.

However, the IRP process is so important in charting TVA's future and in determining TVA's competitiveness that TVPPA's involvement in the IRP process will not be limited to its participation in the review group. Section 113 of the Energy Policy Act of 1992 defines a very active and specific role for TVPPA members in connection with the IRP, and we intend to fulfill that role.

We know that you are concerned with the construction of TVA's nuclear power program. So are we. We know that you are concerned with the process TVA will use in its integrated resource planning process. So are we. We know that you are concerned about the \$30 billion debt limitation placed upon TVA and whether that will be sufficient for future needs. So are we. These are precisely the reasons TVPPA named twenty-eight managers from our members to serve on the TVPPA Power Supply Planning Committee and closely analyze these issues and make our position known to TVA.

One thing that I wish to emphasize today is that as a part of this Subcommittee's consideration, we must be cognizant of not only the need for an economical and safe source of electric power that is generated, transmitted and distributed in an environmentally sensitive manner, but neither can we forget that there must be an adequate and reliable supply of

electricity. In the early years of TVA, the citizens of the region were simply happy just to get electric power. Today, that has changed. Having enjoyed a dependable supply of electricity for many years, and all the benefits that brings in increased job opportunities and quality of life, reliability is important to both businesses and consumers.

During the recent ice storm that devastated so much of the TVA region, including my state of Mississippi, it did not take very long for many citizens to become extremely impatient because of the lack of electricity. There were demonstrations at the offices of some TVPPA members and there were newspaper editorials protesting that service was not restored quickly enough. The Tennessee General Assembly adopted a resolution to schedule hearings between now and its next session to inquire as to why it took so long to have power restored to all customers in the State's capital. There is no reason to believe that a lack of supply of reliable electric power would not cause the same kind of protests -- perhaps protests of greater magnitude. And one cannot build a new supply of power in a matter of days, weeks, months, or even a few years.

It is not just the recent ice storm that should cause one to become cognizant of what happens when there is a loss of electric power. The February ice storm was preceded by a severe cold wave in the eastern United States. The lack of an adequate supply of power in January was the subject of hearings held by the United States House of Representatives Committee on Energy and Commerce, Subcommittee on Energy and Power, on February 9, 1994. While there are agreements for the interchange of power between various generation and transmission utilities throughout the United States, the severe cold in January, 1994, made it apparent that we in this country may well be facing an inadequate supply of power on the nation's transmission grid. Business interruptions and other inefficiencies and inconveniences caused by lack of an adequate power supply are counterproductive to the long-term economic

interests of the United States, not just to the TVA region.

So as the TVPPA Power Supply Planning Committee embarks upon its mission, we will be seeking wise and balanced decisions from TVA, and will offer our views to its management and Board as it deliberates on the ways to maximize the resources economically available to satisfy the electric power demands of the TVA region citizens and businesses from which they derive their livelihood.

At this time, we at TVPPA do not have answers on the issues that you have under consideration. It is a complex equation that will take a lot of time, effort, and detailed analysis of the best information available. Then, it will simply come down to wisdom and good judgment of the TVA Board of Directors to pick the best from what will no doubt be a multitude of varying recommendations from many sources proposing the best solutions to the long-term needs of the TVA region.

It would seem on first blush that completion of one or more of TVA's nuclear plants, TVA's debt limitation, and the integrated resource planning are all bound together. If future generating capacity is required in the TVA region, and the best alternative from the standpoint of economics, reliability and safety is completion of one or more of TVA's nuclear power plants, then funds will have to be made available to implement that. The December, 1993, TVA bond offering documents state that there is about \$25 billion in TVA indebtedness outstanding. We at TVPPA are anxious to explore with TVA the feasibility of meeting the future power supply demands of the TVA region within the scope of its present borrowing authority.

We are also committed as an association to aid and offer our assistance to TVA for its consideration as its Directors make these important decisions. The TVA Act mandates that electric power be made available to the citizens of the TVA region at the lowest feasible rate. TVA is not in the business to make a profit. It exists to serve both the national interest and the

interest of the citizens of the TVA region. There is no reason to believe that TVA would make a decision on future power supply other than in good faith based upon the best information available to its Directors at the time of their decision.

TVPPA members are vitally interested in how TVA conducts its operations over the next years as practically all of us have signed wholesale power contracts on a long-term basis to have TVA supply all our wholesale electric power requirements. We are anxious to do our part to help in any way we are able as TVA conducts its decision-making processes.

Mr. Chairman and members of the Committee, I thank you for the opportunity to express my views to you today.

INTEGRATED RESOURCE PLANNING AND THE TENNESSEE VALLEY AUTHORITY

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before the
Subcommittee on Investigations and Oversight
Committee on Public Works and Transportation
U.S. House of Representatives

March 9, 1994

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to discuss with you: (1) electric-utility integrated resource planning (IRP) and (2) TVA's resource planning and acquisition activities, and (3) the consistency between TVA's actions and IRP principles and practice.*

During the past several years, more and more electric utilities have adopted IRP as the preferred way to plan for and acquire new resources to meet customer energy-service needs. IRP has gone from a state-of-the art endeavor practiced by only a few utilities to one that is deployed on a routine basis by most of the larger U.S. utilities. The U.S. Congress (1992), in the *Energy Policy Act of 1992*, gave a strong boost to IRP in Sections 111 through 115.

TVA's resource plan focuses almost exclusively on its nuclear construction program. It is not acquiring other types of resources, such as gas-fired power plants, renewable resources, or demand-side management resources. Because TVA appears to be pursuing a narrow strategy with no outside involvement in its planning, I can only conclude that TVA has yet to adopt the key elements of IRP.

I urge this Subcommittee to ask TVA to complete a comprehensive, open IRP process by mid-1995. All resources (including the completed and under-construction nuclear plants) should be considered options during this process. And TVA should ensure that outside parties have the resources to provide independent assessments of its planning methods, data, assumptions, and results.

*The views expressed here are not necessarily those of Oak Ridge National Laboratory, Martin Marietta Energy Systems, Inc., or the U.S. Department of Energy.

1. IRP BASICS

Until the early 1970s, resource planning at electric utilities was straightforward. Electricity demand was growing steadily, technological developments were lowering the costs of new power plants, and electricity prices were declining. Since then, the utility industry has seen wrenching changes. Perhaps most important, the era of declining costs ended and was replaced by increasing costs. As a consequence, proceedings before state public utility commissions (PUCs), which had been largely routine during prior decades, became stormy and contentious. Utilities argued for substantial rate increases to pay for escalating capital and fuel costs, while consumer groups opposed these frequent and large price rises.

Although electricity prices have stabilized or declined slightly during the past few years, utilities continue to face fundamental changes. These changes include deregulation of electricity generation; greater access by utilities and others to the transmission systems of other utilities; competition for retail customers from other fuels and even from other electricity suppliers; growing use of energy-efficiency and load management programs as capacity and energy resources; increased concern with the environmental consequences of electricity production; public opposition to construction of power plants and transmission lines; and considerable uncertainty about future load growth, fossil-fuel prices and availability, and the costs and construction times of facilities needed to meet future energy needs.

Thus, as the economics of large utility-owned power plants became less attractive, alternative supply and demand options became more viable. Therefore, the traditional approach to utility planning, with its narrow focus on utility-built power plants, was no longer relevant.

By the mid-1980s many people recognized the need for a new paradigm for resource planning. This new approach incorporates energy-efficient technologies, the changing nature of the utility industry, the public's concern with environmental quality, and the increase in the number of parties interested in utility resource acquisitions. In addition, these developments focused attention on what had always been true but not recognized — customers buy electricity not as an end in itself but as a means to provide energy services, such as comfortable temperatures, light, and motive power. Thus was born integrated resource planning.

IRP is a process that can help utilities and PUCs deal with these changes (Hirst 1992). IRP consistently assesses various demand and supply resources to meet customer energy-service needs at the lowest economic and social costs. IRP involves deliberations among utility planners and executives, PUCs, and customers. These deliberations lead to the development of a plan that will provide reliable and low-cost electric-energy services to customers, financial stability for the utility, a reasonable return on investment for shareholders, and protection of the environment.

Typically, a utility begins its IRP process by identifying its goals and the key issues that the resource plan must address (Fig. 1). Corporate goals often concern customer service, returns to shareholders, maintenance of low electricity prices, and protection of the physical environment. Specific issues might involve forthcoming decisions on an aging power plant that could be retired,

repowered, or restored to full service; a recently begun demand-side management (DSM) programs that might be expanded or modified; or a solicitation to conduct a competitive auction to acquire new resources.

Next, the utility develops alternative load forecasts. Then, the utility assesses the costs and remaining lifetimes of its existing resources and identifies the need for additional resources. (Resources refer to any method used to meet customer energy-service needs, including power plants, contracts to buy electricity from other organizations, and programs that improve the efficiency or timing of customer electricity use.)

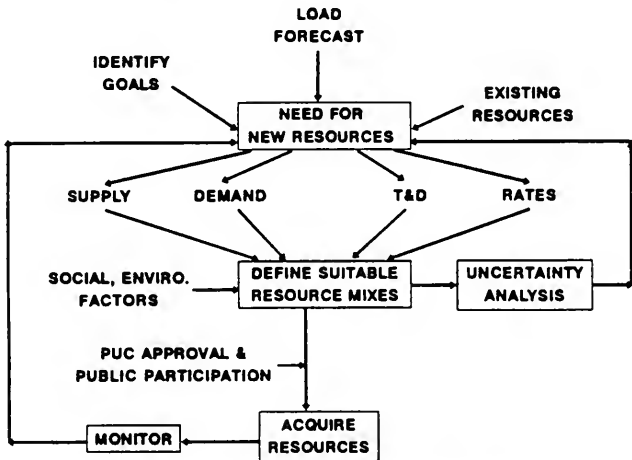


Fig. 1. The activities involved in integrated resource planning.

The utility then assesses a broad array of alternatives that could satisfy the need for electric-energy services, including supply, demand, transmission and distribution, and pricing options. Supply resources include modifications to existing power plants that extend their lifetimes or increase their output, purchase of power from other utilities and from nonutility companies, as well as the construction of new power plants. Utility DSM programs might include (1) promotion of new lighting systems, motors, and other equipment to improve energy efficiency or (2) control of customer loads at critical times. These DSM programs constitute resources that can substitute for power plants, transmission lines, and distribution systems.

Different combinations of these supply and demand resources are then analyzed to see how well they meet future electricity needs and how expensive they are. These analyses are repeated

time and again to test various resource portfolios for their resilience against different uncertainties. These analyses test (1) different assumptions about the external environment (e.g., local economic growth and fossil-fuel prices), (2) different estimates of the costs and performances of different resources, and (3) different combinations of resources. Such uncertainty analysis helps to identify a mix of resource options that meets the demand for electricity, is consistent with the utility's corporate goals, avoids exposure to undue risks, and satisfies other environmental and social criteria.

Then the utility prepares a formal report based on the preceding analyses and on public involvement (Schweitzer et al. 1993). That report presents the preferred resource plan and the reasons why, in the utility's view, this plan represents the best mix of resources. The utility then implements the plan and acquires resources.

While the plan is in force, the utility monitors changes in its environment and its implementation of the resource plan, and the plan is modified as events and opportunities change. Although resource planning is an ongoing process, only once every two or three years does the utility issue a formal plan along the lines discussed here.

As described above, IRP has several key elements:

- Integration of supply, demand, transmission and distribution, and pricing alternatives;
- Coordination and communication among people from various utility departments;
- Participation in the planning process by outside experts, customers, and regulators;
- Treatment of uncertainty;
- Consideration of environmental factors;
- Implementation of the short-term (2- to 3-year) action plan, including acquisition of supply and demand resources, and collection and analysis of data needed to improve planning; and
- Continued monitoring of the plan's implementation and iteration of the planning process.

Public utility commissions (PUCs) also play an important role in requiring utilities to prepare such plans, in establishing the rules that determine the frequency and nature of such planning activities, and in reviewing and approving utility plans (Hirst, Driver, and Blank 1993).

Commissions may choose to specify what economic test(s) the utilities should use in selecting among alternative resources and resource portfolios. As examples, these tests could focus on minimizing electricity prices, minimizing energy-service costs, or minimizing the total societal costs of energy services. The latter measure would include, in addition to the direct

economic costs that customers face, the indirect costs of electricity production and consumption. These indirect costs include those associated with air pollution from power plants, electromagnetic fields from transmission lines; and perhaps the benefits of increased employment in a utility service area caused by the utility's energy-efficiency programs.

PUCs also influence utility use of nonutility parties in development and review of the plan. In particular, PUCs often require a utility to conduct a broad public-participation process as the utility prepares its resource plan. In addition, PUCs generally conduct formal hearings upon receipt of the utility plan, allowing additional opportunity for interested parties to comment on the plan. And PUCs then issue formal orders accepting the utility's resource plan.

2. RESOURCE PLANNING AT TVA

This section of my statement is brief. Its brevity reflects the paucity of information publicly available on TVA's resource planning methods, decision criteria, results, and conclusions.

According to *Electrical World's* latest power-plant construction survey, TVA is the only utility in the United States planning to add nuclear capacity between now and the year 2002 (Bergeson 1994). Thus, while other utilities have canceled or deferred their nuclear construction programs and, in some cases, shut down operating units,* TVA continues work on four units, Bellefonte 1 and 2 and Watts Bar 1 and 2.

In addition to these new-construction activities, TVA continues work on making the Browns Ferry and Sequoyah units fully operational.

On the other hand, TVA is acquiring virtually no non-nuclear resources. For example, U.S. utilities, on average, spent 1% of revenues on programs to improve customer energy efficiency and cut demand in 1992 (Energy Information Administration 1993). However, TVA spent only 0.1% of revenues for such programs that year. And the average utility obtained 20 times as much energy savings in 1992 per dollar of expenditure as did TVA.

For the years 1990, 1991, and 1992, TVA spent between \$1 and \$2 billion/year on its construction program; that amount increased to \$2.3 billion in 1993 (TVA 1993a and b). The majority of these funds are devoted to TVA's nuclear plants. Its plans call for these construction expenditures to continue at near the \$2 billion/year level for the next few years.

Because of its large construction program, TVA's debt now exceeds \$25 billion. Thus, TVA owes its creditor five times its annual revenues. The annual interest payment on this debt was \$1.8 billion in 1993, one-third of TVA's total revenues. In personal terms, almost one-third

*As examples, within the past few years Southern California Edison shut down its San Onofree unit #1, Sacramento Municipal Utility District shut down its Rancho Seco plant, and Portland General Electric shut down its Trojan plant.

of my monthly electric bill helps pay TVA's debt.* It is unclear how and when TVA (i.e., its customers) will repay the principal and interest on this large and growing debt.

TVA's nuclear program began in the late 1960s with plans to construct 17 units. Currently, TVA has nine units complete or under construction. TVA has worked on these projects for more than two decades and has spent billions of dollars on these plants. Therefore, one would expect TVA to have conducted considerable analysis, including risk assessments, to show that continuation of its nuclear program is in the best interest of its customers. Unfortunately, such information is not available to the public. Although I talk regularly with TVA staff, I have been unable to locate any planning reports that provide documentation and justification for TVA's construction program.

The Southern Environmental Law Center filed a Freedom of Information Act request with TVA in November 1992, requesting TVA documents that describe, update, or supplement "existing demand-side management programs within TVA ... May 1989 decision to effectively eliminate TVA's energy conservation programs ... TVA's February 1991 Integrated Resource Plan ... May 1992 adoption of a modified electric rate structure." TVA's (1993c) responses to each of these requests was that "No such analyses are available."

I am not critical of nuclear power per se. Indeed, having worked at a Department of Energy national laboratory for over two decades, I recognize the benefits of a well-run nuclear program. I am, however, concerned about TVA's commitment, year after year, to a set of expensive and inflexible projects. Worse, TVA's record in building and operating these plants is poor; it has consistently failed to meet its own goals and commitments.

In 1991 TVA (1991) issued a resource plan. However, this report presented only TVA's preferred plan and no other alternatives and contained no uncertainty analysis. Therefore, I could not tell the basis for TVA's decisions that continued construction of the Watts Bar and Bellefonte units and restoration of the Browns Ferry units were economically justified. There was no outside involvement in preparation of this plan, which made it even more difficult to assess its quality and relevance.

In Fall 1991, a few people from TVA's resource planning unit spent a day at Oak Ridge National Laboratory to learn about our IRP research. That Fall, I also spoke with the President of TVA's Customer Group and the Vice President for Customer Planning, both of whom committed TVA to initiation soon of a "world class IRP." During the past six months, I have discussed IRP with TVA's Chairman of the Board, President of the Customer Group, two vice presidents, and members of the planning staff.

*The fraction of the typical retail bill used to pay interest on TVA's debt is lower than one-third because retail customers pay for local distribution services as well as for TVA's generation and transmission services.

Section 113 of the *Energy Policy Act of 1992* requires TVA to "conduct a least-cost planning program." In January 1993, TVA staff conducted a briefing for regional environmental groups, in which the agency said that "the actual IRP process would start in several months ..." (Maxwell 1993). In January 1994, I attended a similar meeting at TVA's Chattanooga offices. Soon after that meeting, I wrote to TVA (Exhibit 1) raising several questions about the scope and structure of TVA's IRP; TVA has not yet responded to my questions.

The long delays between TVA's Fall 1991 commitment to develop a world class IRP and when that process officially started (February 1994) are hard to explain. Although Congress did not specify a date by which TVA was to complete a resource plan under Section 113, it probably did not expect TVA to wait 16 months before beginning that process and more than three years to complete the IRP.

These delays strike me as inappropriate for three reasons. First, as noted above, most of the larger U.S. utilities conduct their planning processes consistent with the principles of IRP. An agency with as many capable people as TVA has could have begun its IRP in late 1991 and completed it within a year. For example, the Colorado PUC ordered Public Service Company of Colorado to prepare an IRP in January 1993. The utility conducted an extensive public involvement process, analyzed a wide range of resource options and resource portfolios, considered the environmental as well as direct economic effects of these alternatives, and published a six-volume IRP report in October 1993 (Public Service Company of Colorado 1993). This entire process took nine months.

Second, TVA's delay in starting its IRP process means that it continues to spend large sums of money on its nuclear program without the benefits that a comprehensive IRP can provide. TVA's distributors, directly served customers, and three million retail customers deserve a reasoned, objective, and public analysis showing that TVA is spending their money wisely to provide a least-cost energy future. According to Leonard Hyman (1992), a respected Wall Street analyst of electric utilities:

Nuclear projects proved beyond the capability of many of the utilities attempting them. In retrospect, nuclear construction was no different from any giant project and had the same dangerous characteristics: they required thousands of workers, took years to complete, demanded skilled coordination between the many parties involved in the process, endured changes of specifications and governmental interference, strained the financial markets, and created excess capacity when completed. To top off the list of insults, many nuclear plants not only worked poorly but also proved to be uneconomical. (p. 153)

Hyman's comments suggest that TVA's nuclear focus may not yield a least-cost energy future for the Tennessee Valley.

Third, because TVA's nuclear program absorbs so much time, attention, and money, there is little time, attention, and money left for other activities. Dealing with a nuclear unit is like

"living with an elephant in the living room," according to Portland General Electric (Gist 1993); the elephant dominates. While most utilities are turning more and more to modular gas-fired power plants that can be built in only a few years, TVA continues to focus on construction of very large, capital-intensive plants that require more than a decade to complete and that then operate erratically.

3. CONSISTENCY BETWEEN TVA ACTIONS AND IRP

I find little consistency between TVA's planning process and its resource plan, on one hand, and IRP principles and practice on the other. TVA is acquiring only one kind of resource, using only one fuel, one technology, and one ownership type. By contrast, most utilities acquire a variety of resources, including different fuels, technologies, and ownership.

Most utilities devote considerable attention to developing a resource plan that is resilient to various shocks. They use sensitivity analysis, scenario analysis, decision trees, monte carlo methods, and worst-case analysis to find resource portfolios that will perform well under a variety of possible futures. More important than these analyses, utilities make decisions that recognize an uncertain future. TVA, on the other hand, appears to focus on narrow base-case assumptions that justify its continued emphasis on its nuclear units; TVA's resource strategy is inflexible and contains no diversity.

Many utilities actively involve outside parties in the development of their resource plan, including state government agencies, environmental groups, and representatives of different customer classes. TVA has done all its planning inhouse, with no outside participation.

4. CONCLUSIONS

Craven Crowell (1993), TVA's chairman, recently said:

There are three issues that I will be concentrating on this year. The first is launching an IRP process to strategically determine our supply and demand balance and to create an atmosphere of regional economic development. Another issue is our nuclear-power program—to keep the units that we have on line and to proceed carefully with the construction of our two nuclear baseload units, which come to about 4000 MW. We plan to load fuel in one of these units next year. The third issue is the Dept. of Energy initiative establishing voluntary programs to limit emissions of greenhouse gases to base-year 1990 levels. We signed up for that when DOE first started the program.

I applaud Mr. Crowell's emphasis on IRP. However, I think that the first two issues he listed — launching an IRP process and proceeding with the nuclear program — may be inconsistent. Decisions concerning TVA's nuclear program should be *output* from, not *input* to, integrated resource planning.

I urge this Subcommittee to ask TVA to address four issues critical to the success of its IRP:

- TVA's decision to consider Watts Bar #1, Browns Ferry #3, and Sequoyah #1 and 2 as existing resources, rather than as options, in its IRP. Given the erratic construction or operating history of these plants and the possibility of substantial future expenditures to improve and maintain them, shouldn't these plants be options in the IRP, rather than treated as prior commitments?
- TVA's planned activities at and expenditures on the Watts Bar #2, Bellefonte #1 and #2, and Browns Ferry #1 plants for 1994 and 1995. Is TVA spending only enough on these plants to maintain them as options? Or is TVA converting these options into commitments?
- Stakeholder participation in IRP development and review. How will TVA ensure that its IRP Review Group has sufficient technical resources to provide an independent and competent review of TVA's resource planning methods, data, assumptions, and results? Given TVA's history of optimistic assumptions concerning construction schedules, construction costs, and operating performance, expert outside review is essential.
- Time required to complete the IRP. Given the importance of the decisions that the TVA board must make and the large sums of money at stake, why did TVA take so much time to initiate its IRP and why can't it complete the IRP by mid-1995?

If TVA continues on its present path, I see three possible outcomes. First, TVA's plants will come online as planned and will operate efficiently. Even if this optimistic scenario comes to pass, however, TVA customers may still pay more for electricity than they should. This could occur if the natural-gas, DSM, and other non-nuclear options that other utilities are pursuing turn out to be less expensive than the TVA projects.

Second, TVA's assumptions will prove to be optimistic. In that case, either the U.S. taxpayer will be called upon to repay the TVA bonds or TVA's customers will face sharply higher electricity prices, leading to serious economic problems in the Valley.

Third, if TVA, at the urging of this Subcommittee and others, recognizes promptly the enormous benefits that IRP can provide, these problems may not occur. Indeed, IRP can be the vehicle to help TVA embark on a new course, one that emphasizes cooperation with interested stakeholders and that deploys a broad range of resources to meet customer energy-service needs.

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Eric Hirst
 Corporate Fellow

Exhibit 1

January 11, 1994

Jimmy Cross
 Vice President, Customer Planning
 Tennessee Valley Authority
 1101 Market Street
 Chattanooga, TN 37402

Dear Jimmy:

Thanks for the time and effort that you, Lynn Maxwell, Bruce Landrey, and the other TVA staff devoted to briefing several of us last Friday on TVA's forthcoming IRP plan and process. I really appreciated the chance to learn more about the inhouse analytical process and the public involvement.

Four issues arose during our discussions that strike me as critical to the success of TVA's IRP process and plan:

- TVA's planned activities at and expenditures on Watts Bar #2, Bellefonte #1 and 2, and Browns Ferry #1 during the two-year IRP process should be documented. Lynn Maxwell indicated that these plants will be treated as resource options (not commitments), to be considered along with a variety of other ways to meet the capacity and energy needs of TVA's customers. If this is the case, TVA should provide documentation that it is spending money on these plants solely to maintain them as viable options. In other words, TVA needs to demonstrate that it is not - during the IRP process - converting these options into commitments.
- TVA's decision to consider Watts Bar #1, Browns Ferry #3, and Sequoyah #1 and 2 as existing resources also requires documentation. These plants, although nominally either complete or very close to completion, may require substantial capital investments to make them fully operational and reliable. That is, they are qualitatively different from TVA's other existing resources, such as the Bull Run steam plant and Norris Dam. TVA should make public its prior analyses showing that continued investment in these facilities is so clearly cost effective that they should not be treated as options in the resource plan.
- TVA should make available to its IRP Review Group funds to hire expert consultants. These experts would, on behalf of the Review Group, assess TVA's key assumptions and analyses during the IRP process. If TVA is serious about

Jimmy Cross

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January 11, 1994

serving as the facilitator to this external Review Group (and not managing the Review Group), then it must ensure that this group has the ability and opportunity to examine closely TVA data, assumptions, and analyses throughout the IRP process. Without TVA funding for such expert assistance, the Review Group will not be able to perform its independent review function.

- TVA should accelerate the IRP process so that the final plan is submitted to the TVA Board in May 1995 for Board approval in June 1995. This schedule would provide the Board (as well as all the other interested stakeholders) with the information and analyses needed to make well informed decisions six months earlier than would otherwise be the case. Given the magnitude of TVA's forthcoming decisions concerning several nuclear units, demand-side management programs, purchases from Exempt Wholesale Generators, ways to respond to the growing competitiveness in the electric-utility industry, and responses to increasingly stringent environmental controls, the IRP is needed sooner rather than later.

I look forward to hearing your comments on these four points. I am, of course, glad to work with you to help resolve these issues.

Thanks again for a very interesting meeting last week.

Eric Hirst

cc: Mary Sharpe Hayes

STATEMENT SUBMITTED BY
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
UNITED STATES HOUSE OF REPRESENTATIVES
CONCERNING
THE TENNESSEE VALLEY AUTHORITY'S NUCLEAR POWER PROGRAM

PRESENTED BY
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SUBMITTED: MARCH 9, 1994

Mr. Chairman and members of the subcommittee, I am pleased to appear before you today to discuss the Tennessee Valley Authority's Nuclear Power Program.

My name is Ellis W. Merschoff, and I am the U.S. Nuclear Regulatory Commission's (NRC) Director of Reactor Projects for the Southeast, which includes responsibility for regulatory oversight of the TVA nuclear facilities in operation and under construction. My testimony includes an overview of TVA's early performance and a more detailed description of their performance since the late 1980s. I have included a brief description of the NRC's role relative to the oversight of TVA as Attachment 1 to this testimony.

Background

TVA is the owner operator of nine nuclear reactors located at four sites. Five of the reactor units have operating licenses and four are under construction. A detailed summary of TVA's performance in constructing, operating, and maintaining its nuclear units with emphasis on the 1985 shutdown and recovery is provided as Attachment 2.

TVA in the early and middle 1970s designed and constructed the Browns Ferry nuclear plant consisting of three boiling water reactor units. In the late 1970s and early 1980s, TVA designed and constructed two pressurized water reactors at the Sequoyah site.

Early performance of these five units was adequate, falling in the middle of the performance range in the early years of operation. The most notable instance of poor performance was the fire at the Browns Ferry facility in 1975. Performance at the Browns Ferry units deteriorated in the early 1980s as reflected in NRC Systematic Assessment of Licensee Performance (SALP) reports. In late 1984, and early 1985, TVA voluntarily shut down the Browns Ferry units and in the fall of 1985, TVA voluntarily shut down the two operating units at Sequoyah due to an inability to meet regulatory requirements related to environmental qualification of electrical equipment. The underlying causes of poor performance were attributed to poor management and programmatic deficiencies which contributed to continued poor direction and control of nuclear activities.

TVA developed a recovery program and prioritized the return to service of the operating units. The Sequoyah units were scheduled for restart first, to be followed by Browns Ferry Unit 2. The management structure of the nuclear organization was revised and managers with nuclear experience were recruited from outside TVA to manage the nuclear program. Management programs, such as work control and quality assurance were restructured, procedures developed, plant hardware upgraded and staff retrained.

TVA Current Plant Performance - Operating Units

The Sequoyah units were restarted in 1988 and subsequent safety performance of these units was assessed as good. Generation performance in terms of electrical production by Sequoyah was very high for much of the period

subsequent to 1988. NRC SALP reports assessed performance as good but a declining trend became perceptible at the Sequoyah site in 1992. In late 1992, a pattern of events developed with regard to poor plant equipment performance and staff personnel errors. This sequence of equipment failures/personnel errors culminated in an extraction steam line rupture in March of 1993. A review of causes of this event revealed weak management, failure to maintain balance of plant equipment, and fragmented organizational interfaces. TVA voluntarily shut down both units in March 1993 and performed extensive recovery actions prior to restarting one unit in the late fall of 1993. The other unit is scheduled to be restarted this month.

Following the recovery of the Sequoyah units in 1988, management attention and resources were focused on the recovery of Browns Ferry Unit 2, which was restarted in the spring of 1991. Browns Ferry Unit 2 has performed very well. NRC SALP reports have awarded Browns Ferry Unit 2 superior ratings in several categories of safety operations. The unit has also performed well from an electrical generation standpoint. Browns Ferry Unit 2 recovery and operations have been characterized by stable and capable management, conservative operations and an overall good safety attitude.

Browns Ferry Units 3 and 1 are both shut down and in a recovery mode. Priority attention is currently placed on Unit 3 which is being upgraded to the same standards and procedures as Unit 2. The recovery of Unit 3 has been hampered by the inability to meet schedules and plans. This has been exacerbated by a major change in TVA philosophy with regard to design and construction of power plants. In the early 1990s, TVA decided as an economic

measure to contract out design and construction of plants with TVA providing an oversight and management role while a core group of TVA engineering personnel supplemented by contractors continued to support plant operation. Browns Ferry Unit 3 was involved in this transition and the ensuing difficulty in managing multiple contractors contributed to delays in work progress on Browns Ferry Unit 3. Changes made to TVA project management practices and management organization approximately one year ago have resulted in good progress in the most recent time frame. Productivity has increased and quality of work is in general compliance with regulatory requirements.

Browns Ferry Unit 3's scheduled return to service is in the fall of 1995. Browns Ferry Unit 1's history is essentially the same as Browns Ferry Unit 3, but this unit has a lower priority for return to service.

Current Performance - Construction Projects

TVA has NRC construction permits for four nuclear power reactor units; two of these are at the Watts Bar site and two are located at the Bellefonte site. Following withdrawal of the certification that Watts Bar was ready for licensing in 1986, TVA continued to work towards completion of the construction and licensing process for Watts Bar until December 1990, when TVA voluntarily stopped physical construction work due to work control problems. During the work stoppage, TVA hired a contractor to perform all future construction/modification work and significantly upgraded the work control process and reduced its backlog of items necessary to support construction

work. All systems were transferred back to the Engineering and Modifications organization and a decision was made to again perform the entire preoperational testing program before certifying that Watts Bar Unit 1 is ready to load fuel. Limited construction work was restarted in November 1991, with full construction resuming in June 1992. Since construction restart, almost all work performed has been on Unit 1, or Unit 2 systems necessary to support Unit 1 operation.

The NRC conducted a SALP assessment of Watts Bar performance for the period June 1992 to June 1993. This was the first SALP assessment for Watts Bar since 1985. The SALP evaluated the overall performance of the Watts Bar facility as good. However, the NRC expressed concern about the marginal effectiveness of the quality assurance functions which contributed to a low rating in the area of Safety Assessment/Quality Verification.

In the eight months since the end of the last SALP period, significant changes have been made in the quality assurance area which have resulted in improved performance of the quality assurance function. At present, TVA is conducting the preoperation test program which assures that important components and systems function as intended. The quality of the test procedures and test performance has been acceptable. Progress is being made in the preoperational testing program with completion of a major milestone, hot functional testing, expected in the spring of this year.

The Bellefonte units received construction permits from the NRC in the 1970s, and construction of the plants proceeded until TVA stopped construction of

Unit 2 in 1985 and Unit 1 in 1986 because of decreased load demand. In accordance with NRC's 1987 Policy Statement on Deferred Plants, TVA notified NRC of the deferred status of the Bellefonte units in 1988. Unit 1 was over 90 percent complete and Unit 2 was approximately 50 percent complete and both units were placed in extended layup to preserve the equipment and materials. In March 1993, TVA notified NRC of its plans to resume design and construction activities on a limited basis. Following the NRC's determination that equipment preservation and maintenance programs were properly performed, and that TVA's knowledge of the condition of structures, systems and components was adequate, limited completion activities were resumed.

Prior to the cessation of construction activities, the quality of the design and construction efforts at Bellefonte were considered good. At present, TVA activities to complete Bellefonte are very limited. Efforts are underway to complete the design and engineering work prior to resuming construction activities. Physical work in the plant is limited to system walkdowns to confirm construction status and general preservation and maintenance activities.

Schedule

TVA currently plans to complete all construction and prelicensing testing activities for Watts Bar Unit 1 in time to support licensing and initial fuel load by the fall of this year. This Watts Bar plan is a very aggressive schedule predicated on an efficiently run preoperational test program to demonstrate quality of systems and readiness for operation. Progress is being

made towards licensing, but based on TVA's past performance and the likelihood of schedule impacting test deficiencies which commonly occur in a preoperational test program, some schedule slippage seems likely.

The recovery efforts for Browns Ferry Unit 3 are scheduled to be completed in time to support fuel load in June 1995, and power operation in September 1995, using plans similar to those employed and proven during the Unit 2 recovery. The engineering work is essentially complete, and the modifications work is progressing. At this point, the recovery plans for Unit 3 appear to be achievable.

TVA intends to develop the plans and schedules for the remaining projects (Watts Bar 2, Browns Ferry 1, and Bellefonte Units 1 and 2) as part of an Integrated Resource Plan. The development of this plan will be the subject of public meetings held by TVA between May and November 1994, with completion of the draft plan scheduled for June 1995.

Mr. Chairman, this concludes our statement. I would be pleased to answer any questions that you or the subcommittee may have.

ATTACHMENT 1

NUCLEAR REGULATORY COMMISSION

The Nuclear Regulatory Commission (NRC) was established by the Energy Reorganization Act of 1974 and charged with, among other things, regulation of commercial nuclear power plants, including the Tennessee Valley Authority (TVA) plants, to assure adequate protection of the public health and safety, and the environment.

NRC oversight of commercial nuclear power facilities is provided through both headquarters and regional staff. Headquarters activities focus on development of generic regulations, policy decisions and licensing actions, while the regional focus is on inspection activities to assure licensee compliance with Commission requirements. Each reactor site also has at least two resident inspectors who provide day-to-day oversight of specific plant activities. I am a senior manager from the NRC's Regional office in Atlanta which is responsible for inspection oversight for TVA facilities.

The results of the inspection, licensing, and assessment activities of Resident, Regional, and Headquarters personnel are periodically compiled and used to form the basis of a Systematic Assessment of Licensee Performance (SALP) which categorizes performance as Superior, Good, or Acceptable, in each of four (formerly seven) functional areas for operating plants, and nine functional areas for units under construction. Additionally, the NRC's senior managers meet semi-annually to review the performance of the nation's nuclear facilities and develop what has become known as the "NRC Watch List" of facilities which, due to their poor or declining performance, require increased regulatory attention, up to and including prior Commission approval for restart of a shut down facility.

ATTACHMENT 2**I. TVA Nuclear Program Background**

TVA began a nuclear plant construction program in 1966. At one time, TVA had 17 nuclear power plants under construction or in commercial operation at seven nuclear plant sites. Of the 17, 8 were cancelled (4 in 1982 and 4 in 1984), 5 received operating licenses (2 sites), and 4 remain with active construction permits (2 sites).

The Browns Ferry site is a three-unit site located near Athens, Alabama. Operating licenses were issued for Units 1, 2, and 3 in 1973, 1974, and 1976 respectively. The units are boiling water reactors supplied by the General Electric Company.

The Sequoyah site is a two-unit site located near Chattanooga, Tennessee. Operating licenses were issued to Units 1 and 2 in 1980 and 1981 respectively. The units are pressurized water reactors supplied by Westinghouse Electric Corporation.

The Watts Bar site is a two-unit site located about mid-way between Chattanooga, Tennessee and Knoxville, Tennessee. The units are pressurized water reactors supplied by Westinghouse Electric Corporation and are very similar in design to the Sequoyah units. Neither Watts Bar unit has received an operating license.

The Bellefonte site is a two-unit site located about 60 miles southwest of Chattanooga, Tennessee in Alabama. The units are pressurized water reactors supplied by Babcock and Wilcox Company. Neither unit has received an operating license.

II. TVA Nuclear Power Program Performance That Led to the 1985 Shutdown

TVA's performance in operating nuclear plants prior to 1985 had been declining. A major fire had occurred at Browns Ferry Unit 2 in 1975. Events were occurring more frequently at Browns Ferry after 1980 and at Sequoyah after it received its operating license in 1980. In late 1984 and early 1985, TVA voluntarily shut down all three Browns Ferry units due to a number of regulatory concerns. TVA agreed not to restart the Browns Ferry units without NRC approval. In August 1985, TVA shut down both Sequoyah units due to equipment environmental qualification problems.

In February 1985 TVA certified that the design, construction, testing, and preparation for operation of Watts Bar Unit 1 had essentially been completed in accordance with descriptions contained in the FSAR and other licensing documents. During the spring of 1985, a number of TVA employees informed the NRC and selected members of Congress of safety concerns, primarily related to Watts Bar. In addition, TVA learned of a large number of employee concerns through its own organization. The concerns indicated that many TVA employees had lost confidence in TVA's nuclear management and its ability to properly conduct nuclear

activities. Some of these employees also expressed fear of reprisal from TVA management for voicing concerns. On May 30, 1985, the NRC requested that TVA provide a compilation of all reviews which supported TVA's conclusion that the Watts Bar facility met its licensing commitments.

In response to the recognition that its then existing programs to identify and resolve employee concerns were not fully effective, TVA awarded a contract in May 1985 to conduct interviews of all TVA employees associated with Watts Bar.

During the 1985 period when these events were happening, NRC was conducting the SALP reviews for all TVA plants. In the September 17, 1985 letter transmitting the SALPs for all four TVA sites, the NRC indicated that TVA had demonstrated ineffective management of its nuclear program as illustrated by its continued poor performance. The poor performance was evidenced by: four successive SALP periods with weak performance in Plant Operations for the Browns Ferry facility; three successive SALP periods with weak performance in the Quality Assurance area for Sequoyah and Browns Ferry facilities; three successive SALP periods with weak performance in Maintenance and Security and Safeguards at the Browns Ferry facility; multiple escalated enforcement actions including two Orders and a total of \$895,000 in civil penalties since March 7, 1984; and numerous significant events at TVA facilities.

In the same letter, the NRC concluded that TVA's performance was only marginally acceptable and confirmed TVA's verbal commitment not to restart the operating units without NRC concurrence. NRC also requested that TVA submit information about its plans for correcting programmatic and management deficiencies throughout the TVA nuclear program, for correcting the site specific problems that contributed to the poor SALP ratings, and for correcting the lack of confidence in TVA management and the adequacy of construction of Watts Bar Nuclear Plant expressed to the NRC by TVA employees.

During late 1985 and early 1986, employee concerns about the construction of Watts Bar continued to be raised. The TVA Nuclear Safety Review Staff (NSRS) was assigned to investigate the employee concerns. The NSRS had been established in the early 1980s, reported directly to the TVA Board of Directors, and as a result, was independent of the line organization. The NSRS performed inspections of the TVA nuclear plants in order to advise the TVA Board on nuclear safety. In the fall of 1985, the NSRS expressed concerns about the construction of Watts Bar directly to one of the NRC Commissioners during his visit to TVA. The concerns were that Watts Bar did not meet 10 CFR 50 Appendix B, which prescribes the NRC's requirements for a quality assurance program to assure that nuclear power plants are properly constructed. The concerns expressed were very significant and as a result in January 1986, the NRC asked TVA to formally address these concerns. TVA responded to the concerns in March 1986. In April 1986,

TVA withdrew its 1985 certification that Watts Bar Unit 1 was ready for licensing.

III. TVA Recovery Process

In the fall of 1985, TVA had submitted a Corporate and Sequoyah Nuclear Performance Plan to address the NRC concerns outlined in the September 17, 1985, letter transmitting the SALP reports. In January 1986, the TVA Board of Directors hired under contract a new Manager of Nuclear Power (former Navy Admiral Steven White) from outside TVA to oversee all aspects of the nuclear power program. The manager brought in a new management team of contract managers from a number of companies with experience in the design, construction, and operation of nuclear power plants. The initial task was to set up a new employee concerns program in order to regain employee confidence and to develop a revised Corporate Nuclear Performance Plan to address the programmatic and management deficiencies. The new employee concerns program was initiated on February 1, 1986. The revised Corporate Nuclear Performance Plan was submitted to the NRC on March 10, 1986. In that plan TVA indicated that it had made the decision to focus its resources on resolving the problems at Sequoyah first.

The employee concerns that had been received at Watts Bar prior to February 1, 1986, were placed into a separate employee concerns program called the Employee Concerns Special Program (ECSP). The Employee Concerns Special Program contained approximately 6,000 employee concerns

dealing with specific aspects of construction; engineering; operations; material control; welding; intimidation and harassment (I&H); misconduct; management and personnel; quality assurance; and industrial safety. Most of these concerns were specific to Watts Bar; however, some also contained information about the other TVA nuclear sites.

A. Sequoyah

The Sequoyah recovery involved the issuance of a Sequoyah Nuclear Performance Plan which addressed the issues from the NRC request of September 17, 1985, and the resolution of the 6,000 employee concerns from the ECSP that had been determined to apply to Sequoyah. TVA implemented organizational, programmatic, and specific plant improvements. From early 1986 until the restart of the units in 1988, most of the upper level site management : changed. In addition, many programs were improved and many procedures were rewritten. The focus of engineering was changed from being controlled at the corporate level to being controlled at the site. This improved the engineering response to real time safety issues and the response to reporting these issues to the NRC when they met the reporting threshold. Some hardware modifications resulted from the engineering reviews of the issues.

Unit 2 restarted in May 1988, followed by Unit 1 in November 1988. TVA transitioned from a contract Manager of Nuclear Power (Steven White) to a permanent TVA Manager of Nuclear Power

(Oliver Kingsley). The transition was completed after Unit 1 achieved full power.

Operator and plant performance during and following restart of the Sequoyah Units resulted in a SALP rating of good in operations for the period ending February 1989. The NRC removed the Sequoyah units from the NRC watch list as a result of sustained improved performance in May 1989.

B. Browns Ferry

The Browns Ferry recovery involved the issuance of a Browns Ferry Nuclear Performance Plan which addressed the issues from the NRC request of September 17, 1985, and the resolution of the employee concerns from the ECSP that were applicable to Browns Ferry. TVA implemented organizational, programmatic, and specific plant improvements. From early 1986 until the restart of Unit 2 in 1991, most of the upper level site management changed. In addition, many programs were improved and many procedures were rewritten. Since the TVA manpower focus had been on Sequoyah first, the Browns Ferry recovery took longer. TVA had implemented corporate procedures for many standard programs in 1988, which resulted in the lessons learned from correcting problems at Sequoyah being implemented through these procedures at Browns Ferry. As with Sequoyah, the focus of engineering was

changed from being controlled at the corporate level to being controlled at the site.

Browns Ferry had a broader range of problems prior to its shutdown than Sequoyah. These problems included not only management ineffectiveness, but equipment failures and a poor operational history. Operator performance had been a major problem. The Browns Ferry plant simulator was moved from Chattanooga, Tennessee to the Browns Ferry site in Alabama. This improved TVA's ability to train and upgrade the performance of the operating shift crews. During the six-year shutdown period, operator performance was significantly upgraded. Operator and plant performance during and after the startup of Unit 2 resulted in a SALP rating of superior in Plant Operations for the one-year period ending in May 1992. The NRC removed Browns Ferry Unit 2 from the NRC watch list as a result of a sustained period of improved plant performance.

C. Watts Bar

In 1986, TVA established a group of senior personnel experienced in nuclear design and construction to determine the corrective actions that needed to be completed before fuel load. The resulting corrective actions were grouped to address similar or related problems previously identified by various sources including TVA, NRC, the Institute for Nuclear Power Operations

(INPO), and outside contractors. That initiative was taken to consolidate issues and develop corrective actions that address similar issues collectively through an integrated plan. Because previously completed discovery programs found instances of inadequate root-cause determinations and inadequate recurrence control for identified weaknesses, questions arose about the degree to which the design and construction of Watts Bar met regulatory requirements. In addition, questions arose about the adequacy of the records documenting the acceptability of design, construction, and installation.

TVA decided that to provide reasonable assurance that licensing requirements and TVA commitments would be met, an independent assessment team would be formed to perform an integrated systematic evaluation of Watts Bar. The objective was to look beyond the known problems and perform an overall evaluation of plant design and construction in order to identify all of the corrective actions necessary to license Watts Bar. A key part of the systematic evaluation was the performance of a Vertical Slice Review (VSR) by the Sargent and Lundy Company. The VSR was performed between April 1988 and March 1989 and included an Engineering Review, a Construction Review, and a Records Review. The purpose was to provide additional assurance that the design and construction met licensing commitments. However, due to the extensive number of discrepancies identified, the VSR constituted

a discovery process and corrective actions were included in various corrective action plans.

The assessment team developed the Watts Bar Nuclear Performance Plan, which addressed the issues from the NRC request of September 17, 1985, and recommended 18 Corrective Action Program (CAP) plans and 11 Special Programs (SP) to TVA upper management for approval. The 18 CAPs and 11 SPs do not encompass all the work necessary to license Watts Bar. These plans identify those areas where TVA wanted early review and approval of their proposed approach because of possible negative consequences to Watts Bar licensing if NRC did not agree with TVA plans. The CAPs are general in nature and include plans to identify, determine the scope, and resolve technical issues.

In addition to the above effort, the Employee Concerns Special Program investigated the approximately 6,000 employee concerns received and identified those issues that needed corrective actions. Approximately 700 corrective actions were identified and were issued to the TVA line organization in the 1986 to 1987 time frame. Some of the corrective actions were later included in the CAPs and SPs mentioned above when the assessment team grouped the issues.

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PREPARED FOR THE U.S. HOUSE OF REPRESENTATIVES' COMMITTEE
ON PUBLIC WORKS AND TRANSPORTATION, SUBCOMMITTEE ON
INVESTIGATIONS AND OVERSIGHT, MARCH 9, 1994

I have been interested in energy and electricity issues since the oil embargo of 1973 was imposed while I was working as a Senior Staff Economist at the President's Council of Economic Advisers. I worked for TVA as its Chief Economist from 1980 to 1988.¹ I have been asked by your staff to talk about the competitive prospects of the Tennessee Valley Authority's (TVA's) power system. To do this I have tried to systematically compare TVA to some of its competitors. It is difficult to compare TVA to other power systems so I have relied on as broad and as simple comparisons as possible.

My intent is not to provide a detailed analysis of the relative efficiency of these utilities, individually, but to provide a simple and realistic context for evaluating TVA's situation, strategy, prospects and performance.

My overall conclusion is that TVA is uniquely vulnerable to the increasingly competitive electric power industry, and that TVA's, equally unique, nuclear-based, supply-side, strategy is not a prudent way to protect the interests of its ratepayers.

When its first, major round of nuclear cancellations were deliberated in the 1980s, then-TVA Board Member Richard Freeman said he would vote to cancel because he would not risk his own money on the nuclear plants in question, were they a private investment opportunity.

The "Freeman test" still makes sense to me and today I think Watts Bar 1 is the only one of TVA's unlicensed units that would have much of a chance at passing it.

I want to begin by outlining my conclusions.

SUMMARY

1. TVA is a high-cost producer in an increasingly price- or rate-driven market. To survive TVA must maintain its competitive position by matching the rates of its competitors. TVA will not be able to use contracts or legislation to isolate its customers from the regional or national electricity market over the long term.
2. To remain competitive TVA must reduce or restrain its costs (or increase its revenues) by more than its competitors because TVA faces cost increases or revenue reductions that its competitors do not--primarily as a consequence of its nuclear program and the end of the DOE contract settlement revenues. It will be difficult for TVA to restrain its costs (or increase its revenues) by more than its competitors because:
 - A. TVA's nonfinancial, operating costs are as low or lower than its competitors and trends in TVA's operating costs are very similar to those of its competitors. Thus, unless one assumes that TVA's competitors are considerably more inefficient than TVA is, this means opportunities for TVA to maintain its competitiveness by cutting its operating costs are limited.
 - B. The reason that TVA is a high-cost producer is the unique financial burden it bears as the legacy of its unrealized "investments" in nuclear generating facilities.
 - C. Similarly, opportunities for TVA to increase its revenues by more than its competitors are limited because:
 - i) independent forecasts indicate that economic activity within TVA's service area will grow no faster than in areas served by its competitors and,
 - ii) as a high-cost supplier, prospects for long-term, off-system sales are not good--even if legal barriers were removed.

- iii) Finally, both within and without its service area, energy conservation and improved energy efficiency will provide TVA its most immediate and relentless competition.

3. Paradoxically, over the past five years TVA has been able to maintain its competitive position primarily because of its higher debt.
 - A. Proportionately more high-cost TVA debt meant proportionately more cost reductions from refinancing that debt for TVA as interest rates fell.
 - B. Unfortunately, in the future TVA can not rely on continued reductions in interest cost to maintain its competitiveness, since:
 - i) it is unlikely that interest rates will continue to fall, and
 - ii) TVA's high-cost debt already has been refinanced or is in defeasance.
4. Although doing so will not resolve TVA's current difficulties, these difficulties, in my view, provide a persuasive case for modernizing TVA's system of governance and accountability. To my knowledge, every independent analyst that has looked at TVA in recent history has recommended that TVA's autonomous, full-time, three-member board, charged both with managing and regulating the agency, should be replaced with a regionally based, part-time board clearly separated from TVA's management. Given the support TVA enjoys both in the Congress and the Executive Branch, now is a propitious time to amend the TVA Act to make such changes.

WHY TVA MUST MAINTAIN ITS COMPETITIVENESS

Historically, electric utilities were considered "natural monopolies." That is, businesses where technological or economic realities dictated that one firm could more cheaply supply the market than several competing firms. As a consequence most large utilities, including TVA, became vertically integrated monopolies controlling electricity all the way from its initial generation at the power plant, over its own transmission lines and through its own meters to its ultimate distribution among individual consumers. To prevent utilities from unduly profiting from their monopoly, they were either regulated by public utility commissions or owned by governments or cooperatives.

Today, the world of electrical utilities is very different. The relevant buzz words are competition, deregulation, restructuring, reengineering and reinvention. The conventional wisdom among industry executives and planners is that electric utilities will continue to be buffeted by much the same forces that transformed the firms in the telephone and natural gas industries from regulated monopolies to competitors. As a consequence, most analysts both expect and advocate that electricity generation will become a business in which competing suppliers sell to individual buyers who are able to seek the lowest price over, at least, a wide regional market.

Simple economics, not politics or social engineering, is the fulcrum for change. In the words of Walter M. Higgins, President of Louisville Gas and Electric Co., "The marketplace and evolving technology already portend the demise of the vertically integrated utility. Customers will not tolerate being artificially blocked from access to competitively priced energy options."² Many of the public servants who man the various state public utility commissions also have seen the future and are trying hard to get in front of the parade. Karl Rabago, a Commissioner with the Texas' Public Utility Commission, exemplifies this well when he says, "Our mission is to exterminate the old regulated monopoly and to replace it with competition."³

The Congress has been trying to speed the transition from monopoly to competition in the electric utility industry. Provisions included in the Energy Policy Act of 1992 try both to encourage generation by independent, non-utility, power producers (IPPs) and to ensure that utilities are not able to use their control of the transmission system to prevent IPPs from reaching

potential customers. The federal provisions apply largely to wholesale electricity transactions, but some states are applying the same logic to retail transactions. Georgia, a state in which TVA provides power to nine counties, has enacted legislation that allows new, large industrial customers to choose the utility from which they want to buy electricity.

Most large electric utilities, to use the jargon du jour, are scrambling to "reinvent" themselves and the way that they do business to survive and prosper in this new competitive world. TVA is uniquely vulnerable to these forces both because of: 1) the way it is organized and 2) the financial burden it has inherited from its thirty-year nuclear adventure.

In the 1960's and 1970's TVA sold about half the power it generated directly to 50 or so very large, electric intensive industries and to large federal facilities, principally uranium enrichment plants. By the end of the 1980's, the uranium enrichment plant at Oak Ridge, Tennessee was mothballed and the plant at Paducah, Kentucky was no longer using TVA power because it was too expensive. Moreover, three of the four aluminum smelters located in the Tennessee Valley had closed as well as several very electric intensive commodity chemical and ferroalloy plants. As a result, TVA became much more dependent on its wholesale sales to distributors. Currently about 85 percent of TVA's Power System's revenues are derived from sales of electricity to 160 municipally or cooperatively owned, legally independent distributors which serve as retailers of its electricity.

These distributors, or retailers, can and will leave the TVA system if its power does not remain competitive with its competitors. If they do leave, the debt service from TVA's large "investment" in nuclear facilities will have to be paid by fewer customers--meaning higher and even less competitive rates, stronger incentives to seek cheaper supplies or implement more conservation measures, and so on. I have discussed elsewhere how such a scenario could lead to the dismemberment of the TVA system and why such a dismemberment would be capriciously and arbitrarily inequitable to the remaining ratepayers in the TVA system and bad business not only for TVA but bad business for its bondholders.⁴

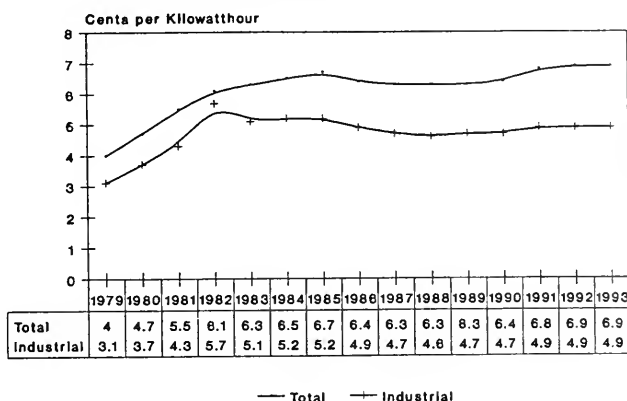
One approach TVA has used to deal with this vulnerability is the use of incentives rates and changes in its contracts with its distributors. One consequence of these changes has been to introduce more disparity between rates charged by distributors of TVA-generated power. In 1990 TVA's largest distributor, Memphis Light, Gas and Power (MLGP), seriously studied leaving the TVA system. To keep Memphis in the system, TVA offered it incentives which have allowed it to charge its industrial customers rates that are about 15 percent lower than those paid by customers in Knoxville, Nashville or Chattanooga.⁵ I do not know how much intra-TVA rate disparity its distributors and their customers will accept, but eventually TVA, necessarily, will run afoul of the principle of reductio ad absurdum in lowering rates to some distributors to make them "competitive" without making the remaining distributors "uncompetitive."

Although many apparently believe that the stable rates that TVA has experienced since 1989 signify that the agency has put its nuclear troubles behind it, as Figure 1 illustrates, stable rates have been the rule rather than the exception in the U.S. electric utility. TVA's rate stability has not improved its competitive position.⁶ Indeed, a symbolic irony is that the Sacramento Municipal Utility District formerly headed by S. David Freeman, the ex-chairman of TVA who became a sort of resident devil for TVA's management team during Marvin Runyon's tenure, also has not increased rates since 1989, and retired, prematurely, its only nuclear plant.

I believe TVA's management recognizes how vulnerable the TVA system is to the dynamics of a more competitive and market-driven industry. They have made "competitiveness" the rhetorical focus of their strategic planning and aggressively pursued cost-cutting in its name.

I do not believe, however, that the strategies that they appear to favor target the fundamental causes of TVA's vulnerability--namely, a balance sheet too heavy with debt and "assets" that produce no revenue. Falling interest rates have provided TVA some much needed breathing room, but the financial oxygen they provided has largely been used up and will not be replenished.

Fig. 1 - Average U.S. Electricity Prices
Total and Industrial, 1979 to 1993



Source: US EIA, Monthly Energy Review,
Dec., 1993. 1993 value based on first
nine months.

TVA'S COMPETITORS:

TVA's most serious longer-term competition as an energy supplier will come from improvements in technologies available to its customers to conserve energy and use it more efficiently. There has been a steady improvement in the efficiency with which we use energy and electricity since energy prices rose in the 1970s and that improvement is expected to continue. However, TVA will also have to compete with other utilities in the evermore competitive regional market and that is the focus of my analysis.

TVA is more favorably situated than many utilities in the nation, but it does not compete with these utilities. TVA's near-term problem is that the utilities it does compete with, share many of the advantages enjoyed by TVA but not its financial disadvantages. The competitors that I have focused on are those "inside" the "TVA Fence," defined by those utilities having interchange agreements with TVA in 1959. In the analysis that follows I focus on three representative utilities.

- Alabama Power, a competitor to the south which like TVA has large coal-fired and nuclear facilities as well as a hydro system.
- Duke Power, a competitor to the east which is more dependent on nuclear power than TVA but also has both coal-fired and hydro facilities.
- Kentucky Utilities, a competitor to the north which depends primarily on coal. (Because of data availability for some comparisons I have substituted Mississippi Power which is similar to Kentucky Utilities).

It is difficult to compare TVA with other utilities. TVA is federally owned, its competitors are investor-owned. TVA is largely a wholesaler while its competitors are retailers, thus they incur some costs that show up on TVA's distributors' books rather than on TVA's. Moreover, several of its competitors are parts of either the Southern Company or American Electric Power--large holding companies. Further each utility reports financial and operating data differently. As a consequence I have relied on as broad and as simple comparisons as possible, utilizing largely data TVA makes available to the public in the circulars accompanying its bond sales and the 10K reports its competitors file with the Securities and Exchange Commission. My intent is not to provide a detailed analysis of the relative efficiency or prospects of these utilities but to provide a simple and realistic comparative context for evaluating TVA's strategy and performance.

COST-INCREASING AND REVENUE-REDUCING FACTORS FACING TVA

Throughout the 1980's, TVA enjoyed a tremendous financial advantage over its competitors as a result of the long-term, take-or-pay contracts it had with the U.S. Department of Energy (DOE) to supply electricity to DOE's uranium enrichment facilities at Oak Ridge, Tennessee and Paducah, Kentucky. As the demand for uranium evaporated, the amount of electricity TVA had to supply to these facilities eventually fell to zero, but DOE's bill still averaged over ten percent of TVA's total revenues over the decade of the 1980s. As a result of the expiration of these contracts and the terms of the settlement of litigation between DOE and TVA, these payments declined from \$456 million in Fiscal Year 1989 to \$160 million in FY 1991 and will remain at that level until FY 1994, when they will end.

A principal cost-increasing factor on TVA's planning horizon is additional depreciation if the nuclear facilities now under construction come on line. TVA has estimated an increase of about \$200 million in additional depreciation when each unlicensed unit becomes operational. Historically operating costs have decreased when new facilities come on line--offsetting the increase in depreciation--because they are more efficient. In TVA's circumstance, however, it is not clear that there will be a decrease in operating costs. Certainly in 1993 (and probably for at least the rest of the decade) the demand for electricity would not have been sufficient to absorb the output of Watts Bar 1 without shutting down some of TVA's existing coal-fired capacity. Even though TVA has considerable older, higher-cost capacity, in my view it is unlikely that Watts Bar 1 could supply power more cheaply--were those older coal-fired units to be retired. Assertions that Watts Bar 1 would reduce per unit, system operating costs rest on the assumption that TVA would be able to operate Watts Bar 1 at much higher rates of utilization than the agency has been able to achieve with other nuclear units.

Another cost-increasing factor is the implementation of the recent Clean Air Act Amendments. Although significant uncertainties remain, a study by Oak Ridge National Laboratory indicates that TVA is likely to be significantly harder hit by the Clean Air Act Amendments than its competitors.⁷ The study estimated that TVA would have to pay an additional cost of about 2.8 mills/kWh, Alabama Power an additional cost of about 2.3 mills/kWh, but Duke and Appalachian Power would only have to incur additional costs of about 0.05 and 0.10 mills/kWh respectively.⁸

I have tried to provide some perspective for the cost-increasing or revenue-decreasing threats TVA faces by recalculating TVA's revenues and expenses as reported in 1993; assuming that: 1) Watts Bar 1 was operational in 1993 and 2) the DOE settlement payments had expired in 1992 rather than 1994. The recalculation is illustrated in Figures 2.1 and 2.2. Although neither the cost increase nor revenue decrease is very dramatic, their combined effect would be to transform TVA's 1993 net addition to retained earnings of \$263 million into a net loss of \$120 million--as shown in Figure 2.2. Without the cushion that stockholder's equity provides investor-owned utilities, TVA operates on a much thinner margin between profit and loss. Thus in the immediate future, TVA can avoid losses only if the cost increases or revenue decreases it will experience are offset by cost decreases or revenue increases elsewhere.

Fig. - 2.1 Example of Effects of End of DOE Settlement Payments and Watts Bar 1 On-line on TVA's Revenues and Expenses

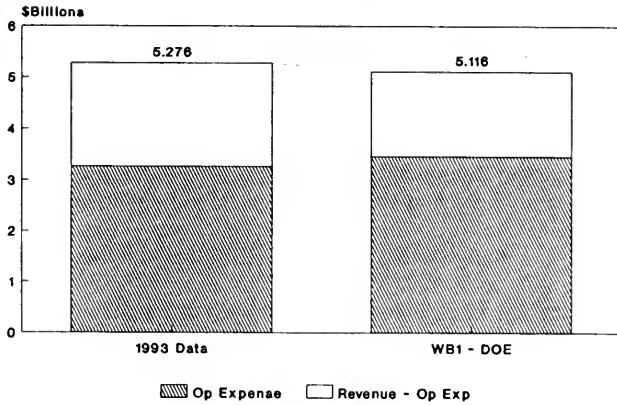
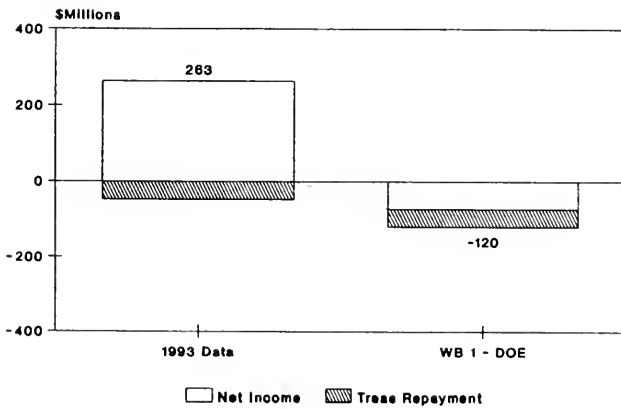


Fig. 2.2 - Effects of End of DOE Payment and Watts Bar 1 Coming On-line, on Increase/Decrease in Retained Earnings



Although TVA's competitors each face potential cost and revenue threats, none face revenue losses anywhere near the relative size of the end of the DOE settlement payments nor do any have large base-load facilities like Watts Bar 1 scheduled to come on line.

Thus the relevant, near-term, strategic question for TVA is: Can enough additional revenues be found or can costs be cut sufficiently to offset the end of the DOE settlement payments and the cost increases associated with Watts Bar 1 and subsequent nuclear units becoming operational? If not, the competitive position of the agency will be eroded and the risk will increase that it will be dismembered by the increasingly competitive electricity market.

PROSPECTS FOR CUTTING OPERATING COSTS

Figures 3.1 and 3.2 summarize a broad comparison of how much revenue TVA and its competitors derived per dollar of operating cost incurred, adjusted to take into account tax (or in TVA's case in-lieu of tax) payments, and depreciation payments in 1992. In making the calculation, TVA's revenues have been reduced by the amount of the DOE-settlement payment received in 1992, since no operating expenses were incurred to earn those revenues.

On a gross basis, TVA received \$1.54 cents per dollar of operating cost incurred, compared with \$1.26 for Alabama Power and \$1.22 for both Duke and Kentucky Utilities. Thus TVA received, roughly, 25 percent more revenue per dollar of operating cost incurred than its competitors. Since TVA's tax bill is considerably less than its competitors, TVA's advantage is reduced to about 10 percent if the same comparison is made net of tax payments--as shown in row 2 of Figure 3.1. By subtracting depreciation as well as taxes from operating costs, a rough measure of what might be termed pure operating costs (such as fuel, wages and salaries, maintenance, etc) can be approximated. Since TVA has higher depreciation charges, on this basis TVA's operating cost advantage increases to about 13 percent, as can be calculated from the data shown in row 3 of Figure 3.1.

I had neither the data nor time available to make more refined or detailed comparisons. But in my view, these simple ratios are persuasive evidence that TVA operates at least as efficiently as its competitors, thus it is unrealistic to anticipate cost-cutting will lower its operating costs relative to its competitors.⁹

Fig. 3.1 - Revenue per Dollar of Operating Expense, adjusted for Taxes & Depreciation: 1992, TVA and Competitors

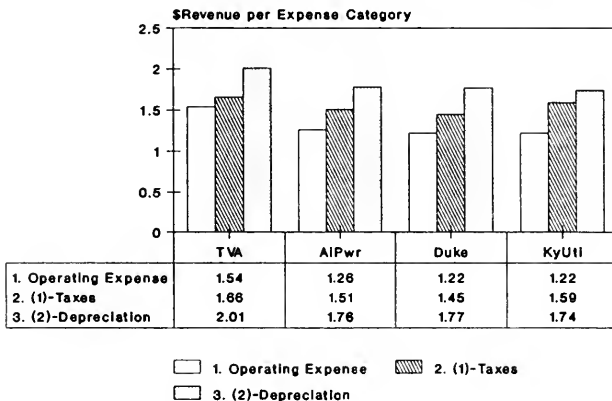
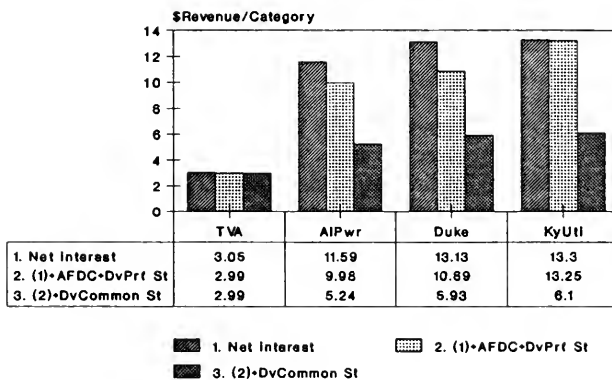


Fig. 3.2 - Revenue Per Dollar of Interest and Financial Expense: 1992, TVA and Competitors



Calculated from TVA 6nd Circular 12/9/93 and 10K reports. TVA revenues net of DOE payment.

TVA's apparent operating efficiency advantage is good news that should comfort its management, employees, ratepayers and bondholders. But, viewed in the context of TVA's imminent need to offset future cost increases, it is also bad news. The three utilities I have used to represent TVA's competition are not inefficient or high-cost operators. Indeed they are all regarded as among the most modern, well managed and operated utilities in the South. Hence, is it realistic to assume that TVA will be able to increase, further, its existing operating cost advantage over these utilities in order to offset the cost-increasing and revenue-decreasing factors previously described?

The "real" bad news implicit in my analysis, however, is apparent in the comparisons shown in Figure 3.2 at the bottom of the previous page. The figure summarizes comparisons of revenue earned per dollar of financial cost incurred. The magnitude of what might be termed TVA's financial disadvantage is apparent. Row one shows revenue per dollar of net interest paid. Row two records revenue per dollar of total interest (without any deduction for funds used during construction) plus dividends paid on preferred stock (which have attributes of a fixed interest obligation). On this basis, TVA earns only about one-fourth as much per dollar of interest as do its competitors. The reason for this disparity is the multibillion dollar "investment" in idle nuclear capacity on which TVA pays interest but which has no analogue on the books of its competitors. Looked at another way, it is a reflection of the fact that a little more than a third of TVA's revenues are required for interest payments on its debt while total interest payments plus dividends on preferred stock for its competitors average only about ten percent of their total revenues.

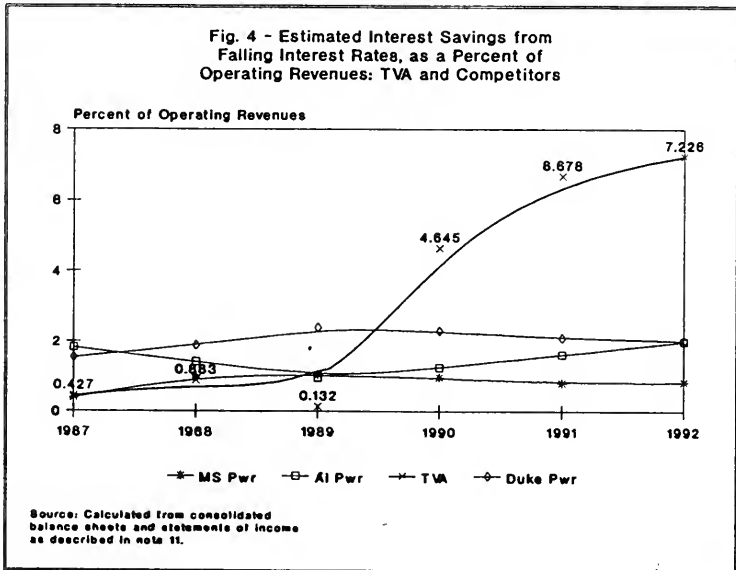
The third row in the table compares revenue earned per dollar of interest plus dividends paid to common as well as preferred stockholders. On this basis TVA's "financial disadvantage" relative to its competitors is reduced from 75 percent to about 50 percent.¹⁰

Regardless of the ratio used, in my view, such comparisons of TVA's "operating advantage," and "financial disadvantage" make the causes and nature of TVA's dilemma clear. It has incurred a disproportionately large debt to acquire "assets" that produce no revenue. Even if these assets become operational and begin to produce revenue it is not clear that TVA's operating cost will go down.

PROSPECTS FOR CUTTING INTEREST COSTS

Paradoxically, TVA's disproportionately high interest cost has been a principal factor in helping TVA maintain its competitive position as interest rates have fallen during the past decade. Because TVA's debt was, relatively, so much greater than its competitors, TVA enjoyed relatively larger interest savings from refinancing its debt at lower interest rates. The principle is analogous to comparing the reduction in the monthly payment of a homeowner from refinancing a mortgage of \$50,000 as opposed to the reduction in the monthly payment of a homeowner with a \$500,000 mortgage. The problem TVA faces, however, is that unless interest rates continue to decline, the reduction in interest cost from refinancing is one-time gain that will not be repeated. Moreover, if long-term interest rates begin to rise, since TVA continually has to borrow not only to pay for new construction but to refinance maturing debt, its costs will increase proportionately more than its competitors.

I have illustrated the relative value of declining interest rates to TVA and its competitors in Figure 4. The figure shows interest savings attributable to falling interest rates as a percentage of operating revenues for TVA and its competitors over the period 1987 to 1992.



I want to emphasize that this is an approximation indicative of the relative benefit of falling interest rates to TVA and its competitors. It is not a precise estimate of the absolute interest saving.¹¹ Nevertheless, the interest savings from falling interest rates were clearly more beneficial to TVA than to its competitors--averaging about three times as great over the 1990 to 1992 period. The reason that TVA's savings were so much larger than those of its competitors was not that TVA reduced its interest cost, per se, by more than its competitors. Indeed if the estimated interest savings used in Figure 4 are related to total interest cost rather than to total revenue, Duke shows the largest relative reduction at about 20 percent followed by Alabama Power and TVA at about 17 percent. It is TVA's larger total interest bill, about 34 percent of total revenues as opposed to about 10 percent (measured as in Figure 4) for its competitors that is responsible for TVA's greater savings.

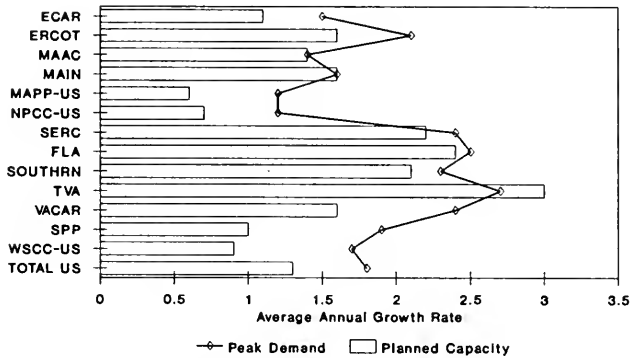
Another way to look at Figure 4 is as an estimate of how much higher total revenues would have had to have been in order to achieve the same financial results. In other words, without falling interest rates TVA would have had to have increased its rates by about three times as much as its competitors would have had to in order to achieve the same results financially in 1990-1992--which would have further eroded TVA's competitive position and increased its market risk.

PROSPECTS FOR REVENUE INCREASES

TVA's demand and revenue forecasts became among the most bullish in the nation during the late 1980s and early 1990s as its commitment to finishing its nuclear construction program apparently strengthened. The North American Reliability Council (NERC) annual supply and demand for electricity forecasts show how different TVA's outlook is from its competitors. Figure 5.1 contrasts projected 10-year average annual growth rates (AAGR) in peak demand and generating capacity over the 1990s for TVA, the three other subregions the Southeast Electric Reliability Council (SERC) and each of the other eight U.S. NERC regions.¹² Not only does TVA lead the nation in expected demand growth, but TVA is the only region shown where growth in generating capacity exceeds the growth in peak demand over the period.

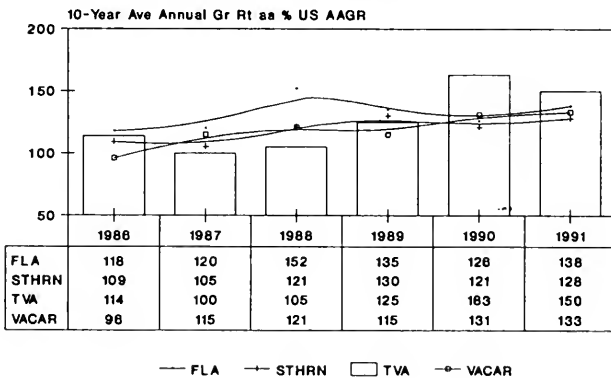
Figure 5.2 contrasts the 10-year AAGR for peak demand for TVA and the three other SERC Subregions by expressing them as a percentage of the U.S. AAGR

Fig. 5.1 - Estimated Peak Demand and
Planned Generating Capacity: TVA, SERC
Subregions and NERC Regions, 1992-2001



Source: North American Electricity Reliability Council, Electricity Supply & Demand, 1992-2001, pp. 9 & 15, see note 12.

Fig. 5.2 - Projected 10-Year Average
Growth in Peak Demand, SERC SubRegions
As Percentage of U.S. Average, 1986-92



Source: Calculated from National Electricity Supply & Demand, N. American Electric Reliability Council, var years.

for the same year. To illustrate, in its 10-year forecast reported in 1987, TVA's AAGR was 2.0 percent which was equal to the AAGR for the U.S. as a whole for that year, thus the value shown for TVA in 1987 is 100. Clearly TVA's forecast was the most volatile over the period, fluctuating from below the other SERC subregions in the earlier years to considerably in excess of them as TVA's nuclear commitment apparently strengthened under Marvin Runyon's leadership. TVA's bullishness is indicated by the fact that the Florida and VACAR (Virginia and the Carolinas) subregions are both high growth areas where population and economic forecasts by the Bureau of the Census and other independent forecasters have consistently exceeded those for the states in the TVA power service area.

Details of the NERC forecasts further underscore the uniqueness of TVA's strategy. For example, the utilities in Florida predict non-utility generation within their subregion to increase by about twenty times between 1991 and 2001. To TVA's north, utilities operating in Virginia and the Carolinas expect a more than doubling. TVA's plan, as reported to NERC, shows zero non-utility capacity in 1990 with none expected by the end of the decade.¹³ Similarly, load management and interruptible demand forecasts--the only demand-side data that NERC reports--shows that Florida's utilities project a 74 percent increase between 1991 and 2001, those in Virginia and the Carolinas a 99 percent increase, while TVA anticipates only a 17 percent increase.¹⁴

These differences reflect the same thinking underlying TVA's apparent strategy aimed at isolating its market and its customers through changes in contracts and legislation. This is illustrated most clearly by the tongue-twistingly-titled provision "Equitability Within Territory Restricted Electric Systems," added to the Energy Policy Act of 1992 (Sec. 722:j) at TVA's initiative. This provision attempts, in effect, to make the "TVA fence," (which many assert prevents the agency from selling power outside its service area) "work both ways"--by keeping cheaper power out of TVA's service area. Similarly, TVA has unilaterally prohibited the legally independent wholesale distributors of the power it generates from purchasing power from independent power producers or industrial cogenerators located in the distributors' own service areas. In contrast, its competitor to the northeast, Virginia Power, recently asked its public utility commission to let it work with 10 large industrial firms to develop cogeneration facilities in order to help these firms minimize their energy costs and, thereby, help Virginia Power retain their load.¹⁵

Given legitimate doubts about its bullish load forecast, one might expect, if TVA is confident that its completed nuclear plants will produce competitive power, that TVA would be trying to tear its fence down--not petitioning the Congress to make it work both ways. To do so TVA probably would have to add a charge--for political, not legal reasons--to exported power to reflect the fact that TVA pays no federal income tax. But if TVA were able to complete its nuclear units and operate them at full roar, it might still be able to compete in high-cost markets that are short of base-load power. If TVA's nuclear units can't compete, completing them will make things worse, because they will drive TVA's costs above those of competitors and thus encourage its customers to seek supplies elsewhere.

Although TVA has regularly denied its nuclear program is driven by aspirations to sell power outside the "fence,"¹⁶ after he left TVA, former Chairman Runyon in an interview said: "I was trying to make TVA a net exporter of power."¹⁷

I have argued elsewhere why I believe reliance on off-system sales is a strategy whose time has passed for TVA.¹⁸ But regardless of its merits, clearly, investing TVA-ratepayer funds to build capacity for off-system sales, in today's rapidly changing electricity market, is a risky strategy which deserves to be discussed fully with the ratepayers ultimately responsible for TVA's debts.

STRUCTURE AND STRATEGY

Why does TVA find itself in such a unique and apparently vulnerable position?

Perhaps the best answer to this question was given by former TVA Chairman Marvin Runyon to a newspaper reporter who asked him why TVA was the only power system in the nation willing to put all its eggs in the nuclear basket. Runyon replied: "[I]nvestors in other utilities worry about whether public service commissions will approve rate hikes to cover unexpected nuclear power costs. TVA doesn't have that problem. If in fact a nuclear plant cost more money than anticipated, TVA wouldn't need anybody's permission to raise the rates to cover the increased cost."¹⁹

The structure of TVA's autonomous, dual-purpose board reflects a paternalistic strongman theory of governance and management, resting on the ahistorical expectation that the Presidential porkbarrel will produce the required strongman. Structuring TVA's system of governance in this way may have been prudent in the 1930s to protect TVA from hostile, regional economic and political forces. Today, no competent student of public administration would recommend it as sensible way to govern a large regional power system.

TVA is currently preparing to undertake a two-year, Congressionally mandated, Integrated Resource Plan (IRP) which is intended to be a comprehensive and objective analysis of the costs and risks of alternative ways of meeting the demand for electricity in future. But TVA's IRP is not likely to answer to the concerns about TVA's future summarized here.

First, it is 20 years late. Second, and more fundamentally, an IRP is normally prepared by a utility but reviewed by an independent public utility commission staff.²⁰ Under the current "dual-purpose" TVA Board system, the IRP process will have to rely on an unrealistic willingness by TVA to engage in massive self-criticism. Without an independent regulatory authority in charge of the IRP or; at least, a larger, regionally based, part-time board for TVA that is clearly separated from management and has independent analytical capability; TVA's IRP will most likely summarize and implicitly defend TVA's current power planning strategy.

•

OPENING-UP "THE" ACT

For over sixty years both because of TVA's unique status, nationally, as the concrete symbol of the New-Deal's accomplishments and TVA's own political popularity in the region, any suggestion that "The [TVA] Act" be amended to improve TVA's system of governance and control, was regarded as a naive or duplicitous invitation to expose TVA to its enemies who were waiting in the halls of the Congress to strike fatal blows at this grand institutionalization of Rooseveltian imagination and initiative.

President Clinton has put two seasoned Tennessee politicians on the TVA board, one of whom, Craven Crowell, is its new Chairman. TVA's new board has begun to deal with some of the factors responsible in part for TVA's difficulties. A new chief operating officer for the agency has been appointed,

nuclear power once again has been separated managerially from the rest of the TVA power system, and TVA's commitment to finish all of its nuclear power plants has been made explicitly conditional on the outcome of the IRP process. These are timely, prudent steps in the right direction.

However the more fundamental point remains that, in origin, these are exogenous rather than endogenous changes. They are chance or random consequences of the election of President Clinton--not an institutional response by TVA's system of governance to a perceived problem. Had President Bush been reelected, TVA would still be plunging full speed down the nuclear trail--not as a consequence of systematic analysis or reasoned public review but as an incidental by-product of presidential politics.

Traditionally, like Presidents, new TVA chairmen get a honeymoon which precludes any tinkering with the TVA Act. But a honeymoon should not supersede the right of TVA's ratepayer for a modern and responsive system of regulation and governance. Moreover with a Democratic President and a TVA-supporting Tennessean as Vice President, this is an auspicious time to make the changes. Neither the prospect of an IRP two years hence nor a new, Democratic board should reassure TVA ratepayers that they will not bear excessive and unnecessary costs as a consequence of TVA's singular and unique nuclear gamble.

To relapse into popular jargon, Marvin Runyon did a lot to "reinvent" TVA. It is now time for Craven Crowell, the Congress and Vice President Gore to finish the job by giving TVA a 1990s, rather than a 1930s, kind of board.

* * * * *

NOTES

1. I speak only as a private individual. I have followed TVA's performance since I left the agency as a part of my professional interest in energy policy and the electric utility industry. I have not been a paid consultant for TVA, its customers, its competition or its critics.
2. Public Utilities Fortnightly, June 1, 1993, p. 28.
3. Quoted in "Remarkable Remarks," Public Utilities Fortnightly, October 1, 1993, p. 6.
4. Allan G. Pulsipher, "TVA and Restructuring," The Electricity Journal, Vol. 4, No. 5, June, 1991, pp. 46-59.
5. TVA agreed to give MLGW a credit for an "internal transmission system" which the agency agreed to make retroactive to the time MLGW signed its previous contract. By doing so TVA reduced MLGW's annual bill by between one to two million dollars and paid it a lump sum of about \$13 million as the retroactive credit. As a consequence MLGW's industrial customers paid an average of \$0.041 per kWh in August of 1993 compared to \$0.0463 in Chattanooga, \$0.0471 in Nashville, and \$0.0476 in Knoxville. Energy Users News, January 1994, p. 72.
6. The rate stability of Alabama Power, Duke Power and Kentucky Utilities is documented in my Electricity Journal article referenced in note 4. Although TVA changed the way it reports rates subsequent to the publication of the article, my reading of the available data is that the previous relationships still hold.
7. E.L. Hillsman and D.R. Alvic, Estimating Costs of Electric Utility Compliance with Proposed Revisions to the Clean Air Act, ORNL/TM-11712, Oak Ridge National Laboratory, 1991.
8. Values are 10-year levelized costs in 1985 dollars. See reference in note 7, p. 37. The authors of the study did not estimate the compliance cost for Kentucky Utilities which could well exceed TVA's.
9. I also compared trends in major operating cost categories for TVA during the past decade and, when data were available, compared trends in TVA's costs with those of its competitors. I found little evidence of departures from

past trends that would indicate significant improvements in efficiency or improvements in TVA's efficiency relative to its competitors. Cost-cutting was widespread in the utility industry and TVA's competitors pursued it as vigorously as TVA. Although there is a small "bubble" in TVA's trend for some cost categories--corresponding to the effects of a record drought and self-imposed nuclear shutdown from 1986 to 1989, the principal feature of note is how closely the trend lines converge, indicating that the same basic cost factors are affecting TVA and its competitors.

10. In 1992 Kentucky Utilities paid an extraordinarily large dividend. To correct for this I used a dividend payment calculated from a five-year average dividend payout rather than the actual 1992 value for Kentucky Utilities.

11. To make the estimate I calculated the ratio between total interest costs plus dividends on preferred stock and total liabilities for TVA and each of its competitors over the period 1982 to 1992. I then applied the average value of this ratio for the period 1982 to 1986 to total liabilities for the years 1987 through 1992 to make a rough estimate of what total interest cost plus dividends on preferred stock would have been had interest rates not fallen. I then subtracted actual total interest cost plus dividends on preferred stock from the estimated value for each year and expressed the residual as a percentage of total revenues in each year. Since interest rates had begun to fall prior to 1982 this is probably a somewhat conservative estimate.

12. ECAR = East Central Area Reliability Coordination Agreement, including states of MI, KY, OH, IN, WV; ERCOT = Electricity Reliability Council of Texas; MAAC = Mid-Atlantic Area Council, PA, MD, DE; MAIN = Mid-American Interconnected Network, IL, WI, MO; MAPP = Mid-Continent Area Power Pool, NB, IA, MN, ND, SD; NPCC = Northeast Power Coordinating Council, NY and New England states; SERC = Southeastern Electric Reliability Council with subregions of TVA and FLA = FL, SOUTHRN = Non TVA parts of AL, MS and GA, VACAR = VA, NC, SC; SPP = Southwest Power Pool, AR, LA, OK, KS; WSCC = Western Systems Coordinating Council, NM, CO, WY, MT, ID, UT, AZ, NV, CA, WA, OR.

13. NERC, 1992, p. 40.

14. NERC, Supply and Demand for Electricity, 1992, p.10. In the previous year's NERC forecast, TVA predicted a decline of 12 percent by the year 2000.

15. Southeast Power Report, 6/18/93.
16. See "Ex-TVA Economist: Nuclear Growth is Targeting Off-System Market," Southeast Power Report, September 25, 1992.
17. Ed Gregory, Nashville Tennessean, 5/16/93.
18. See reference in note 4.
19. Nashville Tennessean, 5/16/93.
20. Organizational "fixes" that have been proposed for TVA range from: a) voluntary or involuntary dismemberment, b) privatization, c) a single-purpose board, d) review/regulation by existing state or federal regulatory agencies, or e) an independent planning/review body patterned after the Northwest Power Planning Council. I favor "c" (a larger, part-time, regionally based, single-purpose board) primarily because of apparent broad, bipartisan support for the concept and because it seems a logical, incremental, first step toward modernizing the agency. To review an IRP adequately, the single-purpose board would have to have access to its own staff or consultants. For an endorsement of the part-time board concept from a Republican viewpoint see, Robert Sansome, TVA Transition Report, 1981. However, the most complete and insightful analysis is given in: Alex Radin and Associates, Report and Recommendations on a Legislative Proposal to Restructure the Tennessee Valley Authority, Washington, DC, January, 1987. The analysis and many of the recommendations of the Radin Report provide the basis for the organizational aspects of the Southern States Energy Board's report, TVA: A Path to Recovery, Atlanta GA, September, 1987. The Radin report was also discussed at Congressional Hearings on TVA's organization convened by then Congressman Ronnie Flippo of Alabama in 1986 and 1987.

TVA Reserve Margin in 1992 - An Analysis
of TVA's inaccurate number-crunching leading
to inaccurate power projections

Dr. Edward Passerini
Professor of Environmental Studies
University of Alabama
October 24, 1993

Reserve Margins

The Federal Power Commission requires utilities to compute the ratio between the amount of power a system can produce (P) and the amount of power needed each year (N). This ratio, P/N, will be greater than 1.00 and the excess over 1.00 is the reserve margin. Beginning in the 1970's, the Federal Power Commission, at the urging of the utilities, began recommending a reserve margin of 18% or greater. This allowed the utilities to then say to stockholders, P.U.C.s and the public: "The Federal Power Commission recommends that we have at least 18% reserve margins, so we've got to build more power plants." There never was any justification for the 18% figure, except the old "well, we always want to have plenty available, just to be sure." In fact, until the advent of unreliable nuclear units, utilities made do quite nicely with reserve margins of 5% or less, which made enormous economic sense.

1992 TVA Reserve Margin

In 1992, the TVA peak load (N) was 21980 MW. (TVA data sometimes show a higher figure, but these figures result from adding in sales outside the TVA area. This is cheating, since sales is always an option, not a necessity). The power figure (P) which TVA uses is Dependable Capacity in Service (DCIS) which, as we will see, is another form of cheating. But let's use it for the moment. 1992 D.C.I.S. was 25618 MW. $P/N = 25618 \div 21980 = 1.1655$. Thus, even using TVA's loaded figures, the reserve margin is almost 17%, very close to the Federal Power Commission's already-inflated standard.

But D.C.I.S. means Dependable Capacity in Service, and the whole idea behind reserve margins is to cope with units that go out of service. For TVA to not even count two units at Brown's Ferry as a part of their capacity is cheating on the numbers and defeats the whole idea of a reserve margin. If you add those two Brown's Ferry units to the capacity you get 27848 MW. $27848 \div 21980 = 1.267$, a huge reserve margin of almost 27%. (Overall data indicates that TVA actually has a capacity of 31000 MW rather than 27848 MW. This would raise the reserve margin to $31000 \div 21980 = 1.41$, a whopping 41% reserve margin. However, I have so far not had the time to calculate exactly how TVA is able to squeeze its 31000 MW capacity down to 27848). But let's use TVA's lower figure, 27848 MW and thus a reserve margin of 27%. Now add 2 units at Watts Bar at 1148 MW each. Now $P = 30144$ and $P/N = 1.37$, a reserve margin of 37%. Such a reserve margin is far beyond what TVA could foreseeable need and indicates that Watts Bar is both diseconomic and unnecessary. The only economic course is to cease work on Watts Bar and Bellafonte, mothball them, and concentrate on efficient management of its current power units.

October 28, 1993

Mr. Craven Crowell
ET 12 A
East Tower, 12th Floor
400 West Summitt Hill
Knoxville TN 37902

Dear Mr. Crowell:

I hope that the two enclosed documents have reached you through internal sources, but I doubt it. Please read the short one (October 24, 1993) and, if it interests you, the long one (October 9, 1992). T.V.A. must now consider whether to stop work on Watts Bar, Bellefonte, or both. As the enclosed power analyses will show, the preferred economic option would be to stop work on both.

The only way to keep TVA electric bills stable is conservation -- Demand Side Management. The only way to keep TVA electric bills from rising sharply is to eliminate as much expensive nuclear capacity as practicable. The only way to keep Knoxville, Nashville and other important markets from leaving the system is to end TVA's welfare-program for industrials and to implement strong conservation (bill-reduction) programs. Implementing this requires an open, honest world-class IRP similar to those being implemented right now throughout the nation. This requires power-projections very different from TVA's current projections. (Projected annual growth rates of 2.5%, comparable to Florida, are absurd.) It requires open public participation. It requires strong leadership from the TVA Board of Directors to ensure that these things really happen. I am concerned that the information you receive from internal sources is the same old inaccurate information which has driven TVA \$20+ billion into debt. I think it is imperative that you consider more accurate information, such as the enclosed analyses, especially if TVA wishes to avoid crashing into the \$30 billion debt ceiling.

Sincerely.

Edward Passerini (Dr.)

**TVA Energy Analysis, Load Forecasting, and Planning:
1976-1992 and 1992-2010**

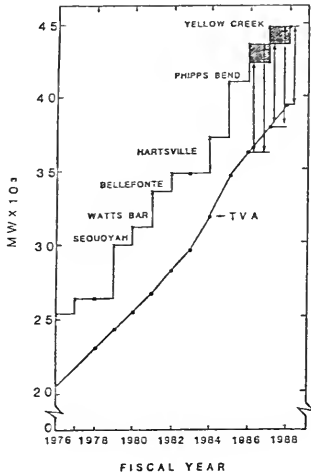
**Dr. Edward Passerini
Professor of Environmental Studies
University of Alabama**

October 9, 1992

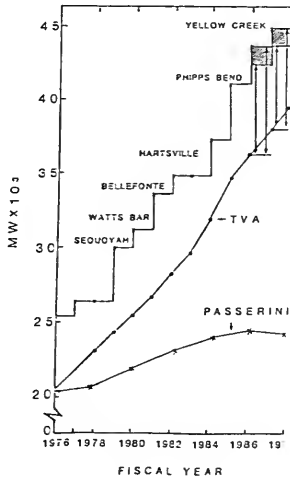
Part I

The Past

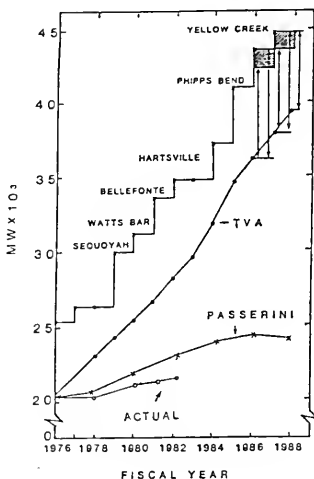
In November, 1977, TVA published the following projection (solid dots) to try to show the need for new nuclear construction (NUREG-0385, Final Environmental Impact statement, Yellow Creek Nuclear Plant, Units 1 & 2, page 8-24.)



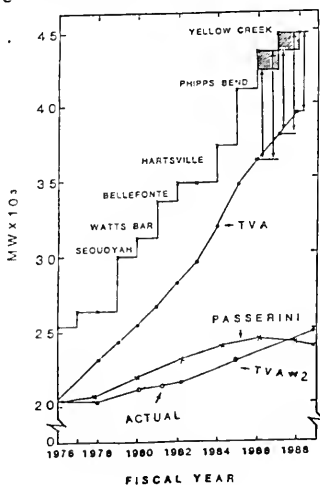
In December, 1977 I sent TVA two analyses (Dec 13 & Dec 27) showing that the TVA projections were highly unlikely and that an accurate (and even generous) projection would be likely to follow the lines plotted by the X's below. These projections are based on Major-Time-Line analysis which is not complicated but which is far more sophisticated than straight-line projections or than supply-driven analysis. MTL analysis also has the advantage of being more likely to be accurate. This graph was also included in my Dec 27, 1977 testimony in Iuka, MS.



What actually happened? By 1982, the actual needs, plotted as open circles below, were even slightly lower than the "Passerini" curve, and for very much the reasons I had stated in 1977.



What did TVA do? They moved their 1982 base from 28 KMW to the actual 21 KMW and offered a revised (and somewhat less steep) projection, plotted below as "TVA #2." This projection flew in the face of all the trends taking place in 1982, especially the obvious need to cut back on uranium enrichment activity. In 1982, I sent another analysis to TVA (Jan 27, 1982) and in 1984 sent the following letter to Chairman Charles Dean.



Mr. Charles Dean
Chairman of the Board
Tennessee Valley Authority
E 12 A9
400 Commerce Ave.
Knoxville, TN 37902

August 6, 1984

Dear Mr. Dean:

Naturally, I am happy that Hartsville A and Yellow Creek are finally being cancelled, saving TVA ratepayers many billions of dollars. Had it been done years ago, as many of us advised, more billions would have been saved.

The question now is; what about Watts Bar and Bellefonte? Conventional wisdom says: "They're almost completed; we should press on." Conventional wisdom also said we should build Hartsville, Yellow Creek, Phipps Bend and Clinch River. Conventional wisdom was, and is, wrong. The TVA estimates were, and are, absurd. The load forecasts on page 8 of the July 1, 1984 "Review of ... Nuclear Plants" are as silly as were the projections back in 1976.

Think a moment. The levelized peak load has fallen consistently during the 1980's and now stands at less than 20 gigawatts. Can anyone seriously believe that there will be a sudden shift to a 4% compounded growth rate every year from now until 1990 and that there will be a need for more than 25 levelized peak gigawatts by 1990? (And even if there were, we could meet it without Watts Bar and Bellefonte.)

I will refer you again to my 1976 projections and estimates which were both accurate and generous. Everything I said in 1976 about employment patterns, costs, saturation, and trend has come to pass and remains true. These patterns will remain at least through 1988. By 1988 we may need to re-evaluate the situation in the light of an expected shift in business cycles between 1988 and 1996. It is possible that electric needs will begin to rise significantly by 1996 and that beyond the year 2000 there will be a need for Bellefonte and Watts Bar.

Meanwhile, there is no need for Bellefonte and Watts Bar. The most economical course would be to mothball these plants for the next 10-20 years until they are needed. This action would show TVA to be forward-looking, concerned about costs, and intelligent. Or, TVA can open these plants with the usual hoopla in 1985 through 1990, pretend that they are necessary, operate them (and other plants) at reduced and inefficient levels - and drive costs up. Please don't.

Sincerely,

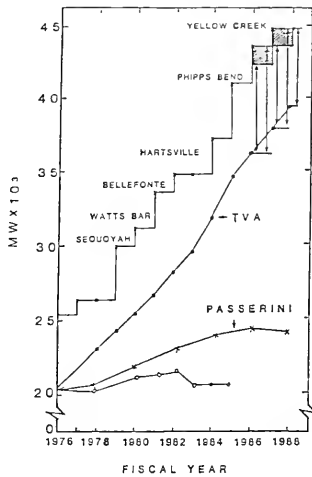
Ed Passerini (Dr.)

cc: R. Freeman
H. Parris

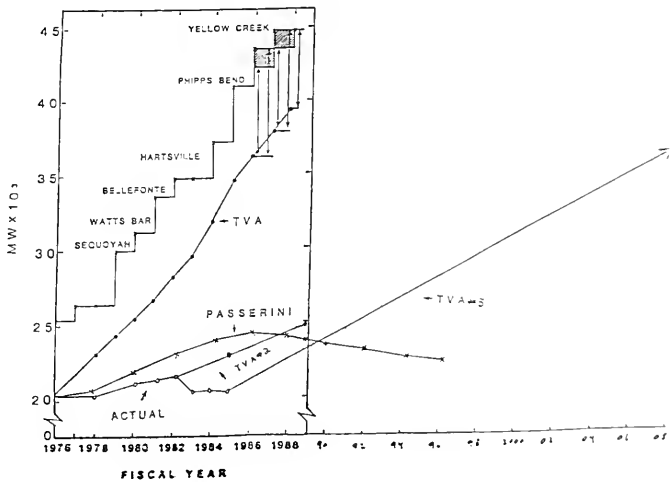
Part II

The Present

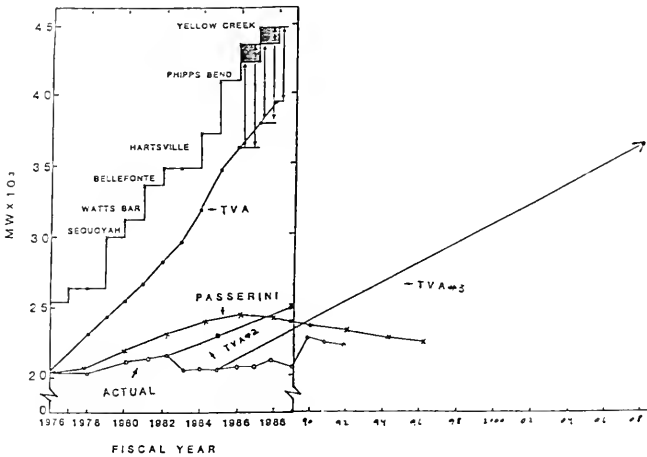
By 1985, the results of conservation, rising rates, reduced enrichment and changing business practices were beginning to show up (open circles). Peak loads plunged and remained lower than expected, primarily due to milder than usual weather between 1983 and 1989.



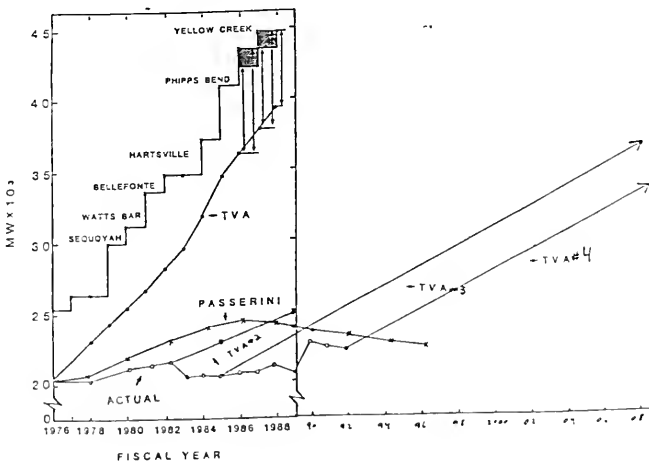
What did TVA then do with this information? They produced another simple linear projection, "TVA #3", even steeper than "TVA #2", and running all the way to 2010 (Load Forecast and Power Supply summary for Fiscal Year 1985, July 1984, Chattanooga, TN, Page A-17). At the same time, I extended my forecast (x's) to 1996, about as far ahead, a dozen years, as I thought necessary in terms of current plant construction.



What actually happened this time? Except for one sudden adjustment for weather (1989 - 1990) the actual peak loads (open circles) continued to track along nicely under the "Passerini" curve through 1992.



What did TVA do? They again shifted the base date forward to 1992 and again ran a highly optimistic projection forward to 2010 (Load Forecast prepared for Fiscal Year 1992, Chattanooga, TN, Oct. 1991, Table A-16).



Part III

The Future

No doubt TVA has made equally inaccurate projections based on other years, and no doubt will probably continue to do so. It would seem logical that, at some point, TVA would realize that shifting the base and continuing to make unrealistic projections is counterproductive. To date, however, there is no evidence that TVA wishes to implement data-based, trend-consistent, real-world projections. Perhaps 1993 will be different.

Meanwhile, let me offer ten suggestions about how to do peak-load forecasting for the 1990's and beyond. Since my Major Time Line analyses seem to have a very accurate trend record, versus TVA's constantly-revised, constantly inaccurate projections, I hope these ideas will be considered seriously.

First, we must note that the population of the TVA area is not growing rapidly and that both national and regional demographic trends (family size, immigration patterns, etc.) indicate that this is not likely to change in the next decade or two. In fact, we expect population growth rate to decrease over this period. USA by Numbers, Susan Weber et al., Washington, D.C. 1988, pp. 22, 31, 40.

Second, we must note the decade-long trend away from an energy-intensive industrial economy into an energy-frugal service-and-entertainment economy. This trend will accelerate as energy prices inevitably rise beyond 1995. The Next Economy, Paul Hawken, New York, 1983, Passim.

Third, we must realize that there is and will continue to be a glut of enriched uranium at \$121 per S.W.U. and that even using hideously inefficient methods such as gaseous diffusion (5 to 20 times less efficient than gas centrifuge) to prop up electricity sales will no longer suffice. Science for Democratic Action, Fall 1992, Arjum Makhijani, p.9.

Fourth, note that even this option may not remain open as the U.S. "floating price" hovers around \$104 per S.W.U. and Russians are already unloading surplus S.W.U.s in Europe at even lower prices. Science for Democratic Action op. cit.

Fifth, we must note that energy-consumption in the TVA region has remained low in spite of desperate recruiting to try to promote electricity sales.

Sixth, we must note that electricity sales have remained well below 25 KMW a.p.l. even though there haven't been any significant efforts to promote conservation and alternatives for over a decade and even though the prices of these alternatives have not dropped as expected.

Seventh, note the constantly declining major indicators over the past decade (factory orders, corporate bankruptcy rates, unemployment, housing starts, personal debt - now standing at \$4 trillion, equal to the national debt. etc.) It would seem abundantly clear that we must lower our expectations for energy-sales rather than to raise them.

Eighth, note what truly progressive utilities are doing even in areas where population growth is rapid. Pacific Gas and Electric "plans to meet 75% of electric load growth projected for the 90's with customer energy efficiency. The remaining load growth will be met with renewable generation sources and more efficient use of existing facilities and of the distribution grid....Our own very conservative studies suggest that in excess of 25% of current electric use can be saved. Later studies by the Electric Power Research Institute suggests a range of 22-44%...." (John C. Fox, Manager, Energy Efficiency Service for P.G.& E. before the Joint Economic Committee, U.S. Congress; April 28, 1992.)

Ninth, we must pay attention to the usually - ignored implications of TVA's own studies, seriously flawed though they may be. For example, Dan E. Birch's A Quantitative Choice Model of the Demand for Housing (TVA, Feb 1990) analyses why people prefer single family dwellings but misses the point that an increasing percentage of people are and will be choosing multi-family dwellings because it's all they can afford. (All five "cases" studied by Birch are designed to show that there will somehow be a differentially increasing rate of single-family dwellings in the future in spite of the fact that the trend is in the opposite direction even in the TVA area.) Now look at trends in other areas of the country and it becomes clear that the trend toward multi-family dwelling will probably increase, not decrease. Then note, as Birch accurately does, that these units

use 6400 KWH/y versus 9400 KWH/y for single-family dwellings and you get another piece of information that can be used for accurate load forecasting.

Tenth, TVA must seriously re-evaluate its forecasting capability in light of its lack of success. Interestingly, the Systems Forecasting Group doesn't even seem concerned about long term accuracy, in spite of the fact that it continues to make forecasts up through 2010. Also interesting is the fact that they would conclude "short-term" forecasting, defined as "2-3 year" is of some use. (By definition, a 2-3 year forecast isn't going to be very far from wrong, because the load doesn't change swiftly and is mostly due to weather fluctuations. However, a 2-3 year forecast is almost useless in planning future building/implementation/retirement scenarios.) I am astounded to read statements such as: "While accuracy is pertinent for the short term forecast by virtue of budget performance requirements, it is much less pertinent to the long-term forecast." (Quality Criteria in Long-Term Forecasting, William F. Irish, T.V.A., Chattanooga, TN, June 1992, p.24.) It seems to make little sense to make forecasts if they are simple straight-line supply-driven forecasts rather than trend-and-reality-based forecasting.

What are the implications of a reasonable forecast (18-25 KMW a.p.l.) for the 1990's and beyond? The implications are the same as they were in 1984: (1) Mothball Bellefonte and Watts Bar because they are unnecessary, thus saving \$5-8 billion. There can be no question that the construction and operation of unnecessary nuclear plants is the single major reason why TVA is now servicing a long-term debt of \$20 billion and plans to borrow over \$1 billion per year for the next 8 years. (2) Put the remaining Brown's Ferry unit(s) in "passive standby" (or whatever the current jargon is) rather than spending \$1-2 billion to bring it to active standby/on-line status. (3) Develop federally-financed programs (through D.O.E., D.O.T., etc) to bring new genres of industry on-line in the T.V.A. area. This would be similar to the advances T.V.A. made in the 1930's and utterly unlike the more-business-as-usual approach of the 1980's. (4) Develop an aggressive Demand Side Management policy. An aggressive DSM policy would go well beyond current pricing/load management activities and would include extensive new programs in (a) conservation (b) alternative energy sources (c) water-level management (d) watershed protection

and (e) cooling load management. And all this is merely the tip of the iceberg, assuming T.V.A. wants to take an accurate running start at the 21st century.

Briefly, then, how should TVA go about trying to get some idea of it's future capacity needs and how to achieve it?

First, adopt an accurate methodology such as Major Time Line. Major Time Line analysis works as follows. First, one must look at past trends and how they force future trends. For example, past success often forces future failure in finite systems, a process which is often overlooked in straight-line or supply-driven analysis. Then, once one identifies the 10 to 20 major (macro-) forces which will affect future electricity needs, then one does a micro-analysis to insure that the macro-forces are accurate. For example, if 15 major indicators show that the household-use of electricity will rise slowly from 1977 to 1984, then peak and decline slowly, one must make sure that the micro-factors (electronic efficiency, consumption patterns, etc.) justify such a projection. Once the major factors have been adjusted by the micro-factors, then a relative time-line for the major factors is run for whatever time-length seems reasonable, noting that projections tend to become less and less accurate with longer time lines. (I have rather arbitrarily chosen 12-year time lines, but I am finding that MTL is accurate enough to justify somewhat longer projections). The time lines are then combined and linked to an index-date to produce a single--and rather accurate--projection for electricity needs.

Second, hire people who know how to apply the methodology.

Third, ascertain the major and minor variable and project them. Since this step is the core of the project, it is vital that the staff are both broadly interested in social trends and aware of the technological trends which are likely to emerge during the forecast-period.

And, finally, boil all this down into a likely range of projections--or even to unlikely forecasts as long as they are carefully identified as unlikely, edge-of-the-envelope, forecasts.

The most important factors in projection of variables are honesty and intelligence. This observation may sound obvious but most projections are inaccurate due to bias on the part of the researcher. The most common problems are:

1. Goal-oriented prophecy. If the researcher desires a given result, their data will reflect this bias, and the projection will reflect the researcher's bias rather than the likelihood of reality.
2. Ignorance. Lack of information or overlooking information is a serious source of error.

I cannot emphasize enough the necessity for accurate forecasting. Had TVA followed its own forecasting, they would have built Yellow Creek, Phipps Bend and Clinch River and would now be around \$80 billion in debt rather than merely the \$20 billion caused by completing Sequoyah, refitting Brown's Ferry and work-in-progress on Bellefonte and Watts Barr. It is critical that TVA begin to down-size its generating capacity, develop new markets (See Part 3 or recommendations on p.6), and begin now to manage the water-shed and air-shed in a much more responsible and integrated fashion.

TVERC
**Tennessee Valley
Energy Reform
Coalition**

**TESTIMONY BEFORE
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
UNITED STATES HOUSE OF REPRESENTATIVES**

By

Dr. Stephen A. Smith
March 9, 1994

Mr. Chairman and members of the subcommittee, my name is Stephen A. Smith, and I am the executive director of the Tennessee Valley Energy Reform Coalition (TVERC). Our organization was formed out of a growing realization that the energy policies of TVA were fundamentally out of step with the rest of the country. TVERC represents concerned citizens within TVA's seven-state service area. TVERC's technical advisory board has grown to include national energy experts who share our concerns. Our mission is to make TVA environmentally and financially accountable to the people of the Tennessee Valley. This mission will only be successful through the reformation of TVA's current energy policies and the restructuring of the TVA decision-making process.

TVERC seeks to become an effective voice and messenger for a new vision for the valley. We have advocated that TVA open up its decision-making process to the public. We have actively tracked the Integrated Resource Plan (IRP) from before its congressional mandate through its current delay to its still yet undefined status. We have been publicly critical of TVA's lack of leadership and minimal efforts in the field of energy efficiency and demand-side management services. Today, as a representative of TVERC, I welcome your renewed interest in TVA and its future.

Member Groups

*Western North
Carolina Alliance*

*Kentucky
Resources
Council*

*Tennessee Citizens for
Wilderness Planning*

*The Alabama
Conservancy*

*Tennessee
Environmental
Council*

*Campaign For a
Prosperous Georgia*

*Foundation for
Global Sustainability*

Historically, TVA has represented the best of government planning. TVA was a positive force for change in our region and the country. From rural electrification to flood control and the reclaiming and restoring of ravaged lands, TVA was viewed as good government at work. Over the years, TVA has been presented as a national and international model. Its historical importance to this country cannot be overstated. Within the past few decades, however, the agency has lost its focus. Through a series of miscalculations and inflexibility, TVA has become an embarrassment and potential burden to our region.

If reformed, the Tennessee Valley Authority could continue playing a vital role in the lives of the eight million people who call this valley home. The issues I raise here today are crucial. If we treat them seriously, then we will have taken the first step along the road to recovery. That is why TVERC exists — to expose difficult problems and propose better solutions that will serve as a road map for returning TVA to a position of leadership for our region and our country.

FINANCIAL MISMANAGEMENT AND TVA'S DEBT

Today, TVA carries the largest financial debt of any utility in the country. The Office of Management and Budget (OMB) presently lists TVA's debt at over \$28 billion dollars. In 1990, the Virginia Electric Power Company (VEPCO), about half the size of TVA with a 12,250 mW peak capacity, had about a \$3.8 billion debt paying \$356 million in interest. Duke Power, another TVA neighboring utility, with a 14,000 mW capacity had a long-term debt of \$3.1 billion. Similar comparisons can also be made with other large utilities in the Northwest. No other utility has a debt that comes close to TVA's. William Malec, TVA's Chief Financial Officer, in a recent letter-to-the-editor in the Knoxville News-Sentinel appears comfortable with the magnitude of this debt and claims that it "is just the cost of doing business." As a ratepayer and a concerned citizen, I find it disconcerting that no other utility in the country finds it necessary to carry this level of debt to provide energy services to their customers. Indeed, over 36 percent of TVA's operational budget, or \$1.8 billion, goes to service the interest of this debt. While Malec has been effective in taking advantage of lower interest rates, the millions he so eloquently describes as "saved" are still orders of magnitude below the billions he will not discuss.

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TVA has no publicly stated plan to repay this debt. As demonstrated by the savings and loan crisis and the federal deficit, unregulated spending and massive debt will lead to financial crisis and economic instability. TVA should be commended for addressing the spiraling rate increases in the 1980's through efforts to stabilize rates. At the same time, the failure to adequately control high levels of spending has resulted in the continued increase of TVA debt thus setting the stage for future rate shocks more severe than those in the past. Another disturbing scenario with national implications is the possibility of TVA defaulting on its bonds. With default, the possibility for a federal bail-out cannot be dismissed. TVA's current Wall Street AAA-bond rating is not based on a sound financial condition; rather, Standard & Poor has stated that this bond rating stems more from the implicit support of the U.S. government to back TVA's bonds.

If recent trends continue, over \$1 billion will be added every year to this growing debt. TVA is now rapidly approaching the \$30 billion debt ceiling authorized by Congress in 1979. The original intent of this \$30 billion credit line was to complete 17 nuclear power reactors. Today, only Sequoyah unit 2 and Brown's Ferry unit 2 are operational. Sequoyah unit 1, which has not operated for the past year, is slated to begin operation this month. This does not demonstrate sound financial management. The agency now stands at a major financial crossroads. TVA could ask Congress to extend the \$30 billion debt ceiling or the agency could tighten their belt and make tough choices about future expenditures in their power program. TVERC believes that it is time for TVA to address the root causes of their financial mismanagement and deal responsibly with this massive debt.

THE NUCLEAR POWER PROGRAM

TVA's nuclear power program has been the largest drain on the agency's financial resources. The nuclear power program also serves as the clearest example of how lack of accountability and poor management practices have led the agency astray. It is ironic that TVA is the only utility in the nation actively constructing nuclear power plants while other utilities are canceling nuclear facilities under construction and/or retiring nuclear plants prematurely. This trend away from nuclear power investment is largely attributed to rigorous economic analysis mandated by either public utility commissions or by thoughtful utility managers. Indeed, TVA Chairman Craven Crowell was recently quoted as saying, "If we were a private utility, we wouldn't still be constructing nuclear plants. But we're a government agency and we have access to capital that allows us to continue construction. We're in the nuclear construction business because of our uniqueness as a federal utility." I ask why it makes economic sense for TVA to continue with nuclear construction when it does not make economic sense for other utilities?

A good example of this lack of accountability and management failure exists with the ongoing problems at the Watts Bar nuclear plant. Today, after 22 years of construction, the Watts Bar nuclear plant is nearly nine billion dollars over budget and has yet to generate a single kilowatt of electricity. In 1985,

senior managers at TVA certified to the Nuclear Regulatory Commission (NRC) that Watts Bar was ready to load radioactive fuel. The true condition of the plant became known, however, when employees came forth with safety issues still unaddressed at the plant. Through investigations, it was discovered that TVA had made material false statements about the plant's readiness — a serious act which highlighted systemic management and safety problems throughout the agency's nuclear division. In 1986, the NRC pressured TVA to shutdown the entire nuclear program. Instead of commending the Nuclear Safety Review Staff (NSRS) employees who initially voiced concerns about the plant's readiness, the TVA management penalized these employees and then disbanded the NSRS.

Employee concerns continue to exist at the Watts Bar facility. According to a January 7, 1994 NRC report, (Report of the Review Team for Reassessment of the NRC's Program for Protecting Allegers Against Retaliation) on nuclear whistleblowers, TVA generally and the Watts Bar plant specifically, continue to have the highest levels of employee concerns in the nuclear industry.

In 1988, TVA stood before this committee and stated that Watts Bar would be up and running within a year. Five years and billions of dollars later, TVA is before this committee again with the same message. Senior TVA management are still unable to accurately predict cost expenditures and completion schedules at Watts Bar year after year. Over the past four years, the fuel load date has been delayed no less than six times. The projected cost of completion continues to skyrocket as the agency spends more than a million dollars every day at this plant. Still yet, there are conflicting reports about the present level of work still needed to complete the facility. A recent memo leaked to an organization within our coalition summarizes the concerns of the NRC senior resident inspector at Watts Bar, stating that it may take two to five years to get Watts Bar on line. The NRC Chairman, Ivan Selin, recently stated on a visit to the Watts Bar plant that no other nuclear plant in the country has been so extensively reworked. The present dates to complete the plant are optimistic at best. The implication of continued scheduling delays, however, will cost Tennessee Valley ratepayers hundreds of millions if not billions of dollars.

As troubled a history as the Watts Bar plant has, TVA is now willing to "bet the ranch" that unit one will get an NRC license and run better than any of its other nuclear units. If TVA loses this gamble, the real losers will be the ratepayers of the Tennessee Valley.

TVA'S INTEGRATED RESOURCE PLAN: THE ROAD TO RECOVERY

Across the country, Integrated Resource Planning (IRP) has become the foundation of utility planning. TVERC recognizes that for the Tennessee Valley Authority, responsible Integrated Resource Planning will be the cornerstone to the energy future of the Tennessee Valley region. Billions of dollars are still yet to be spent in the agency. Key decisions still remain around TVA's nuclear power program, the potential for conservation and efficiency programs, development of renewable technologies and regional competitiveness.

For the last decade, the United States has been going through an energy transformation away from a society largely dependent on fossil and nuclear fuels to a growing reliance on environmentally sensitive energy services and renewable energy technologies. As electric utilities face both environmental and economic challenges in the coming decades, it is becoming more imperative to embrace energy diversity and environmental sensitivity. TVA's challenge is to select from all viable sources and offer a diverse mix that offers the region the most value for its money. One of the most important issues that must be addressed in embarking upon this plan is uncertainty. Resource options carry a variety of uncertainties including resource performance, future costs, availability of fuel, public acceptability and a host of other factors. Resource plan models can be tested for a variety of scenarios anticipating uncertainty and building confidence in a future course.

Two areas where TVA has been notoriously inaccurate are in predicting both future load growth forecasts and nuclear power plant reliability. TVA's Integrated Resource Plan should be the testing ground for continued investments in troubled and uncertain facilities like Watts Bar Unit 1. TVA's senior management has convinced the TVA board that Watts Bar need not go through the IRP process. In direct contradiction to this plant's history, TVA management argues that the plant will be licensed and operational before the IRP is complete. Incredibly, TVA now views the troubled Watts Bar facility as a committed resource not subject to the rigorous analysis of the IRP. In addition, TVA also views Brown's Ferry Unit 3 as a committed resource even though this facility has not operated since 1985. Unfortunately, the agency refuses to provide the documentation supporting the current cost projections and schedules for these plants nor the agency's alternatives if the facilities do not perform as predicted. In short, TVA continues to ignore uncertainty in its energy planning. This has the potential to undermine the IRP process from the beginning.

TVERC also argues that as part of the IRP effort, TVA must solicit meaningful public participation. As part of this effort, TVA has proposed an IRP Review Group. It remains unclear how this Review

Group will be constituted and what resources this body will have. TVERC argues that independent analysis of TVA's fundamental assumptions must be available to the Review Group. This necessitates that TVA provide financial resources to the group so that they can seek analysis outside of the agency's institutional bias.

Lastly, TVERC is concerned that TVA will deemphasize the potential benefits gained from energy efficiency and renewable technologies in an effort to justify a one-dimensional approach to energy production — nuclear power. Today, a revolution is taking place across the country at other utilities in maximizing energy efficiency services in meeting future energy demands and/or delaying future production facilities. Although controlling demand through efficient use of energy will not solve all of TVA's future energy needs, cost-effective demand-side management programs should be fully exploited before any new production facilities are brought on-line.

TVA REFORM

As stated before, TVERC's mission is to reform TVA's current energy policies. Ultimately, TVA's energy plans should be based on acquiring the least costly, most environmentally responsible mix of resources including the conservation of energy. The least-cost planning framework provides economic, engineering and environmental criteria for evaluation of alternatives on a consistent basis. Least-cost planning provides the objectivity required to make significant investments and resource decisions. A well done Integrated Resource Plan will serve as the foundation for building the least cost framework into TVA's energy policies.

Good planning can only take you so far. Ultimately TVERC realizes that the many problems experienced by the agency over time can largely be attributed to a lack of accountability to the citizens of the Tennessee Valley. Decisions costing the region billions of dollars are made regularly without any system of checks and balances. Structural reform of TVA's decision-making process must become a priority of Congress. Possible models for change would include the Pacific Northwest Electric Power Planning and Conservation Act (Public Law 96-501) creating the Northwest Power Planning Council. The eight million citizens of the Tennessee Valley must have more of a voice and better representation in the decisions affecting their future. The appointment of a "Blue-Ribbon panel" to analyze possible scenarios for alternative decision-making and oversight structures could begin this process.

In closing, I would like to share a personal vision for the Tennessee Valley — a vision that returns to the roots of the TVA mission. The Tennessee Valley Authority could be — and should be — this nation's model utility serving as a national and international laboratory for sustainable economic development in an environmentally sensitive region of the country. Combining the resources of the Department of Energy's Oak Ridge National Laboratory, the University of Tennessee, other regional universities and our distributor community, TVA could be on the cutting edge of energy efficient services and technologies. As a research and development lab, the agency would serve as an incubator for technologies that will eventually be implemented across the country. Today, we are only scratching the surface on the potential benefits of this important market. As this country's largest federal utility, TVA could stimulate market development in clean renewable energy technologies thus creating more jobs, more sustainable economic growth and less environmental degradation. Most importantly TVA will be doing the right thing, what is good for our region, our country and the world. Only then will TVA regain its place as a leader and an agency we can all be proud of.

WE RESPECTIVELY SUBMIT THE FOLLOWING RECOMMENDATIONS.

■ The Integrated Resource Plan completed in a comprehensive and timely manner.

- Watts Bar unit 1 and Browns Ferry unit 3 should not be considered committed resources and should be fully analyzed as part of the IRP. Start-up of these plants should follow not lead the IRP process. In addition, particular attention should be paid to the Watts Bar unit 1 site operation since it is presently a "clean" site and loading of radioactive fuel will cause major cost increases due to future decontamination and decommissioning of the site.

- TVA should accelerate the IRP process so that the completion date can be at least six months earlier than the current target date of late 1995.

■ TVA must include meaningful public participation in the IRP.

- TVA should appoint a diversified IRP Review Group including a broad diversity of ratepayer representation. This representation must include the large sector of low-income ratepayers.

- The IRP Review Group must receive funding for analysis of TVA's primary planning assumptions to maintain an independent role during the energy planning process.

■ TVA Reform

- Congress should appoint a panel to study possibilities of structural reform for the decision-making process at TVA with a goal to include greater meaningful public participation and accountability.

■ TVA should make sustainable energy development a goal within the agency's power and economic development programs.

As part of its environmental research laboratory in Muscle Shoals, Alabama TVA should actively research energy efficiency and renewable technologies with a goal to implement sound and cost-effective models within the agency's power program.

TVERC

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Energy Reform
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*The Alabama
Conservancy*

*Tennessee
Environmental
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*Campaign For a
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A Fund to Change

March 27, 1994

Mr. Randolph Deltz
Committee on Public Works and Transportation
Subcommittee on Investigations and Oversight
Room 586, Ford House Office Building
Washington, DC 20515

Dear Randy,

The Tennessee Valley Energy Reform Coalition (TVERC) submits the following documents to the Public Works and Transportation Oversight and Investigations Committee. These documents are to be included as part of the official record for the March 10, 1994 congressional hearing addressing issues pertaining Tennessee Valley Authority.

■ **Enclosure 1: "Debt of the Tennessee Valley Authority"**

This document was submitted from the Tennessee Valley Authority to the Tennessee Valley Energy Reform Coalition last year in response to questions regarding the agency's debt.

■ **Enclosure 2: Integrated Resource Planning documents**

The following enclosure includes the two letters sent from TVERC to TVA Chairman Craven Crowell since his initiation into the agency. These letters reflect TVERC's official position with regards to TVA's Integrated Resource Plan.

■ **Enclosure 3: Cost estimates and Projections of Watts Bar Unit 1**

This table was compiled by a TVERC organizational member group, Global Sustainability, to document cost projections and completion schedules for the Watts Bar Unit 1 reactor. Chairman Crowell stated that the completion of Watts Bar Unit 1 is a "1 percent decision." But as stated in the hearing, Watts Bar was also said to be a one percent decision in 1988. Since 1988, the agency has spent over two billion dollars just on unit one. Supporting documents are referenced and are available through the Global Sustainability Energy Project.

Enclosure 3 also includes an internal memo released to the Global Sustainability Energy Project detailing the concerns of the Senior NRC Resident Inspector of the Watts Bar facility. This memo — officially substantiated by the NRC through a *Nuclear Week* article (enclosed) — details the Inspector's concerns that it may take 2-5 years to complete Watts Bar Unit 1.

■ **Enclosure 4: TVA Nuclear Power Program: Capacity Factors**

This enclosure documents the capacity factors for all of TVA's licensed nuclear facilities since the inception of their operation. While capacity factors are generally available to the public through the Nuclear Regulatory Commission, we have found the agency's calculation of the nuclear program's reliability misrepresentative. TVA excludes approximately 3-4 years from the capacity determination citing 1985-1988 as not subject to the capacity factor equation. This exclusion effectively increases the agency's lifetime capacity factor which are among the primary statistics used by utilities to determine power plant reliability. The numbers compiled in this document by Charles Komanoff Associates (based in New York City) accurately reflect the capacity factors for the agency's nuclear power program.

■ **Enclosure 5: Standard & Poor's rating analysis**

TVERC has submitted Standard & Poor's bond rating of the Tennessee Valley Authority. The rating notes the implicit support of the U.S. government as a primary justification for the high rating.

Please do not hesitate to call with any questions.

Danielle Drotsch

Global Sustainability Energy Project Coordinator
TVERC Coalition Member

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Enclosure 1

DEBT OF THE TENNESSEE VALLEY AUTHORITY

INTRODUCTION

Concern has been expressed in some quarters about the level and growth of the debt of the Tennessee Valley Authority (TVA). The purpose of this paper is to give the facts about TVA's debt and, hopefully, to eliminate any misconceptions.

OBLIGATION TO PAY

The 1959 Self-Financing Amendment to the TVA Act requires TVA to raise funds based solely on the revenues of its power production program. Interest payments, as well as any principal payments required, must be funded from present and future power revenue. The debt of TVA is not debt of the United States' taxpayer. To emphasize this fact, the front cover of every TVA debt offering circular contains the following legend in boldface type:

**THE BONDS WILL NOT BE OBLIGATIONS OF, NOR
WILL PAYMENT OF THE PRINCIPAL THEREOF OR
THE INTEREST THEREON BE GUARANTEED BY,
THE UNITED STATES OF AMERICA.**

Though it is clear that TVA debt obligations are not obligations of the United States' taxpayer, TVA's borrowings are included in the U.S. budget. This seems inappropriate, however attempts by TVA to remove its debt from the U.S. budget have thus far met with congressional opposition.

TVA'S DEBT IN PERSPECTIVE

The debt of an individual is supported by future earnings. An individual may have to reduce debt as future earnings projections are reduced. An eighty year old individual, for example, would have a difficult time obtaining a thirty year mortgage. The debt of an individual must, therefore, be for a fixed period of time. A definite maturity is necessary because the individual will eventually die. The lending institution needs

assurance that it will be repaid, as well as some method of amortizing the debt.

The debt of a corporation, such as TVA, is also supported by future earnings. However, a corporation need not die. As long as the corporation continues to grow and meet its obligations out of current revenues, there is no need for it to reduce debt. Some corporations in the United States have had debt on their books for two centuries.

TVA can comfortably support its debt. Even so, TVA's debt has, in real terms, actually been trending downwards in recent years. This can be clearly seen in Exhibit 1. In addition, as shown in Exhibit 2, the debt limit mandated by congress has not been increased since 1979.

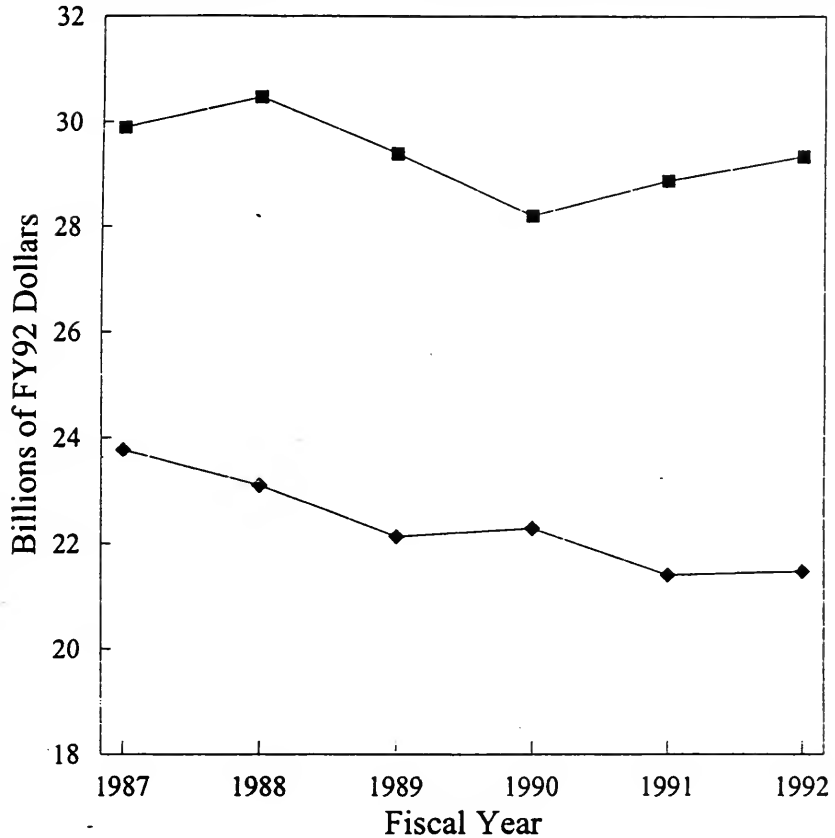
The federal deficit is of concern because the government is borrowing money to pay for current operating expenditures. TVA, on the other hand, does not run an operating deficit. In fact, TVA is legally required to pay all of its operating expenses out of operating revenues. TVA does not borrow to pay interest expense. In effect, TVA has a balanced budget requirement. TVA may borrow only to acquire assets which can be used to produce future revenue and reduce emissions. In the utility industry, these assets typically have lives of forty years or more. Exhibit 1 also clearly shows that TVA's assets are greater than TVA's debt.

CONCLUSION

The character of the debt of the Tennessee Valley Authority is significantly different from that of both the United States government and individuals. TVA does not run an operating deficit, but uses debt only to obtain tangible assets used to generate future revenue and reduce emissions. The U.S. taxpayer is not obligated to pay any of TVA's debt. In addition, TVA's debt level is reasonable, and has, in real terms, been trending downwards in recent years.

EXHIBIT 1

ASSETS AND DEBT OF THE TENNESSEE VALLEY AUTHORITY

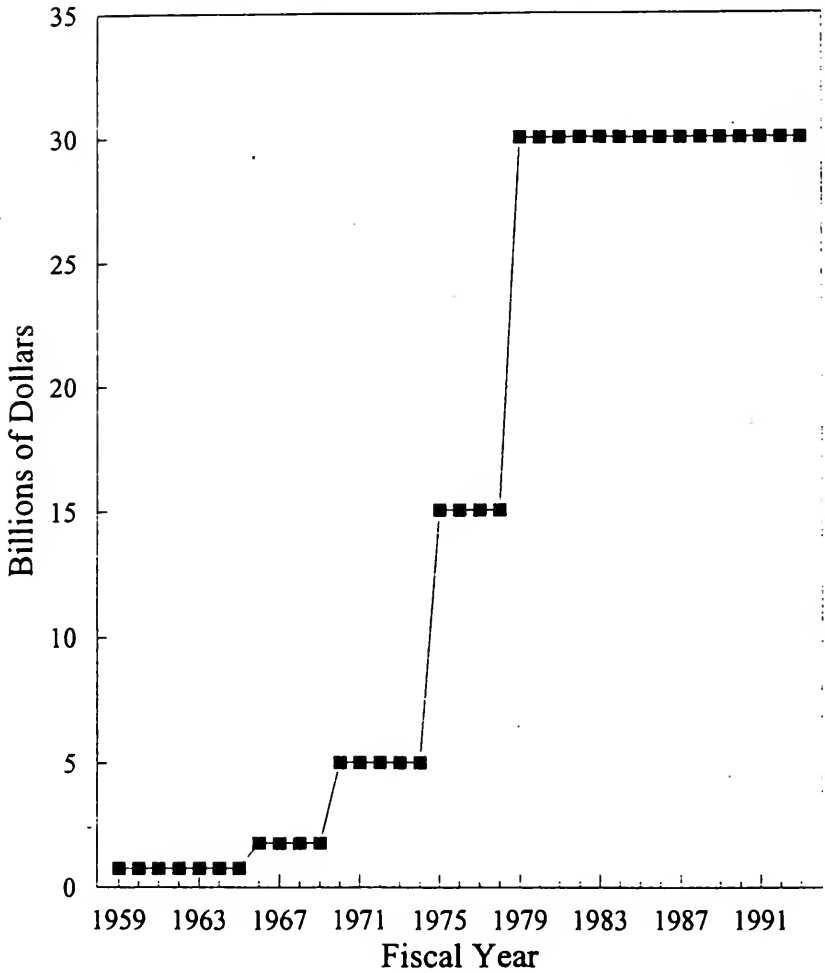


■ Power Program Assets

◆ Long-Term Debt, including Nuclear Fuel Lease

EXHIBIT 2

DEBT LIMIT OF THE TENNESSEE VALLEY AUTHORITY



TVERC

Tennessee Valley
Energy Reform
COALITION

Enclosure 2

September 15, 1993

Mr. Craven Crowell
Chairman of the Board
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Dear Mr. Crowell,

Thank you for taking the time to meet with us on August 10 in Nashville. We found the meeting frank and informative and look forward to a continued open dialogue with TVA.

We covered a great number of issues and points at this meeting. To ensure clarity, we want to confirm and reiterate key topics covered.

Energy planning processes must reflect a greater concern for the long-term viability of the Tennessee valley. Cost-effective and environmentally benign technologies should be emphasized over building new generating capacity. We look forward to working with TVA and TVA distributors to educate and assist the public in acquiring technologies and services which promote energy efficiency.

Integrated Resource Planning (IRP) is the best way to level the playing field for all resource options and openly explore TVA's power needs and least-cost methods to meet those needs. As stated in the Energy Policy Act, the IRP must "evaluate the full range of existing and incremental resources, including new power supply, energy conservation and efficiency, and renewable energy resources, in order to provide adequate and reliable service to its electric customers at the lowest system cost."

We were pleased that you agree that the IRP process must be open and include meaningful public participation. An open process means that there must be early and full access to the information available to all interested parties including non-TVA experts. This information must include primary data and planning assumptions. Additionally, meaningful participation requires that groups should be able to work with TVA. Participating groups must not be forced to only respond to the agency.

We also discussed the need for putting all power plants on the table and are particularly glad that you agreed with us on this point. All plants — whether coal, hydro or nuclear (including plants which are operating, mothballed or under construction) — must be fully analyzed. Specifically, risk assessments must be completed for each plant as a part of the IRP process. Analyses would include projected construction costs, assessments of completion dates for plants under construction, and projected operating and

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maintenance costs. An independent review of past predictions of cost and dates to complete TVA's plant construction is needed to assess manager's ability to accurately predict future generating options. Only with this kind of comprehensive approach to power planning, can we get an accurate picture of the true costs and benefits of available alternatives to meet future customer energy needs.

In order to evaluate energy-planning options fairly and comprehensively, no additional funding should be directed toward new generating capacity until the IRP has been completed. This must include Watts Bar Unit 1. Construction activities must follow — not lead — the planning process. Unnecessary start-up of the Watts Bar nuclear plant would cause significant increased cost therefore, preventing other options that may be more cost-effective.

We understand that there are existing capacity shortages which result from the unreliability of the existing nuclear units. If these problems continue, we would agree that a process to deal with short-term capacity needs may be necessary to evaluate alternatives such as purchase of power, construction of modular peaking units or other options. We would see this as a part of a valid IRP.

A thorough and fair IRP process must also include independent analyses completed on key IRP issues. This would signal TVA's commitment to eliminate any institutional bias within the agency that may affect the outcome of the planning process. Areas needing independent review include load forecast and availability of cost-effective efficiency programs for the TVA service area. TVA should be responsive to requests for such analyses using the agency's models to run varied assumptions.

We hope the IRP process will begin soon; we remain frustrated by the lack of movement on this important planning tool. It has now been nearly two years since TVA first announced its intention to do a "world class IRP" and it has been over nine months since our first official meeting with TVA on the status of the IRP. Although some informal meetings have been helpful, it is our general impression that little progress has occurred. Our concern remains that TVA continues to make power decisions without having completed an open and comprehensive planning process to meet the energy needs of our region. With your leadership, we are ready to set aside our frustration and join together in the development of a truly world class IRP.

Again we thank you for taking the time to meet with us. We have enclosed some additional elements we feel are a critical part of the IRP. We look forward to working with you and the TVA staff in a positive and constructive manner to develop an IRP that will meet both the economic and environmental needs of the valley.

Sincerely,

Stephen A. Smith
Executive Director, TVERC
President, Foundation for
Global Sustainability

John E. Sherman
President, TVERC
Executive Director,
Tennessee Environmental Council

ESSENTIAL ELEMENTS OF AN INTEGRATED RESOURCE PLAN

■ At the outset of the process, all the players involved in the IRP process should establish objectives, goals and ground rules for the planning process. Numerous utilities across the country have established very successful non-adversarial forums in which to develop their IRPs. Creating a working relationship among all parties relies on both access to all information and data used to develop the planning documents and a "real" opportunity to provide comment and input to the decision-making process.

■ The integrated resource planning process must, as its name implies, ensure a true integration of the various demand and supply options into scenarios that evaluate different mixes of resource options against the environmental, economic and social impacts. These various scenarios should be evaluated from different perspectives — the utility, the different ratepayer classes, and the Tennessee Valley as a whole.

■ In determining the cost-effectiveness of demand-side management resources, TVA must use a total resource cost test. The total resource cost test considers costs and benefits regardless of the distribution of costs and benefits among the utility, program participants, and non-participants. Rate impact or non-participants tests have been abandoned by many utilities as a primary screening mechanism as those involved in the IRP process recognize that stability of long-run rates and reduction in overall bills should be the principle factor in determining cost-effectiveness of DSM programs.

■ We recognize there are equity issues relating to demand-side management programs and rate subsidization. These problems should be addressed by program design and diversity, not in elimination of the programs.

■ The long-term integrated resource plan must be supplemented by a two-year action plan that clearly specifies the utilities implementation plans. In addition to demand and supply acquisition plans, the short-term action plan should contain a detailed method for evaluating and monitoring the plan to determine whether the IRP has achieved the objectives outlined at the outset of the process. TVA must be willing to make short-term adjustments if changes are needed to meet their goals.

TVERC



Tennessee Valley
Energy Reform
COALITION

January 15, 1994

Mr. Craven Crowell
Chairman of the Board
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Dear Craven,

I wanted to thank you and your staff for the January 7 briefing on the public participation process of TVA's forthcoming Integrated Resource Plan (IRP). As you are well aware, TVERC remains very interested in the development of TVA's IRP. While the presentation by Jimmy Cross, Bruce Landrey and Lynn Maxwell was informative, we realize they do not have the authority to resolve the areas of disagreement identified at the meeting. Although few in number, these issues are critical for a successful IRP.

THE IRP REVIEW GROUP

The constitution and function of the Review Group will be crucial in the development of a thorough and creditable IRP.

■ TVA should provide funds for hiring independent expert consultants. We applaud the stated role that TVA will be a facilitator rather than a manager of the Review Group. This group must have the opportunity and ability to examine closely TVA data, assumptions, and analyses throughout the IRP process. Without TVA funding for such expert assistance, the Review Group will not be able to adequately perform its independent review function. Research demonstrates that independent funding is the best way to assure a top-rate IRP.

■ TVA should seek broad representation on the IRP Review Group. Following the meeting on January 7, we remained unclear on how the Review Group would be constituted and how the representatives would be selected. TVERC feels the Review Group must represent a board cross section of Tennessee Valley interests allowing for sensitivity to race and gender representation. Stacking the Review Group with one particular perspective will only undermine the group's credibility. TVERC not only represents a coalition of autonomous organizations but also a technical advisory board knowledgeable in specialized areas critical in the IRP process. We feel that two representatives from our coalition would be a fair number on a twenty-member panel. Dr. Ed Passerini and Dr. Eric Hirst should be viewed as independent of TVERC and are logical representatives for the academic and DOE National Laboratory communities respectively.

EXISTING AND FUTURE RESOURCES

■ TVA should clearly document activities and expenditures on Watts Bar 2, Bellefonte 1 and 2, and Browns Ferry 1. At the briefing, these plants were set apart from other non-operational or plants under construction and viewed as resource options, not commitments. We understand that these plants will be considered along with a variety of other ways to meet the future energy needs of TVA's customers (a position we strongly agree with). If this is the case, TVA should provide documentation that it is not spending money on these plants at a rate faster than required to maintain them as viable

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options, i.e. expenditure levels during the IRP process should not transform these plants into commitments.

■ TVA should justify the decision to consider Watts Bar 1, Browns Ferry 2 and 3 and Sequoyah 1 and 2 as existing resources. Although Sequoyah 2 and Browns Ferry 2 are presently operating, with Sequoyah 1 planned to be operational soon, lifetime capacity factors for these units are well below the industry average thus calling into question their reliability as existing resources. More disturbing are TVA's assumptions that the troubled and unlicensed Watts Bar 1 and Browns Ferry 3 (a unit that has not operated since 1986) are currently listed as existing resources. Even under the most optimistic projections, an attempt to make both of these plants fully operational and reliable will require substantial capital investments. Both the large amounts of money and the high level of uncertainty make these units qualitatively different from TVA's other existing resources, such as the Paradise coal fired plant or the Wilson Dam. TVA should make public its prior analyses supporting the assumption that continued investment is so clearly cost effective that these plants should be treated as commitments. The IRP would be the best and most logical forum to test these assumptions. Failure to subject these plants to the full rigor of the IRP process undermines the plan from the outset.

THE TIMELINE

■ TVA should accelerate the IRP process. An IRP should be the foundation document upon which all good decisions stand. The magnitude of TVA's forthcoming decisions concerning several nuclear power plants, methods of meeting more stringent environmental controls, regaining a leadership position in efficiency programs, growing competitiveness in the electrical industry, questions around the debt and the cost-of-service study all point to the fact that the IRP is needed sooner rather than later. Accelerating the process six months should not compromise the process. A target of May 1995 would represent a commitment to move the process forward with deliberate speed and give the Board more flexibility in future planning. With billions of dollars and the future of the agency before us, it is imperative that a good IRP be available to you and other Board members.

The environmental and public interest communities strongly support your stated commitment to environmental leadership. We look forward to a continued constructive working relationship. An open and credible IRP will go a long way in building trust in this relationship.

I hope you will find the enclosed comments both challenging and reasonable. As TVA stands at a crossroads, we continue to believe that the Integrated Resource Plan serves as the map into the future for the residents of the Tennessee Valley.

I look forward to your response on these important issues.

Sincerely,



Stephen A. Smith, DVM
Executive Director
President, Foundation for Global Sustainability

cc Johnny Hayes
William Kenney

Enclosure 3

WATTS BAR UNIT 1

(does not include cost projections and schedules for Unit 2)

Date	Current Investment	Scheduled Fuel Load	Projected Cost to Finish
12/72	\$0	1978	\$625 million
1/84		June, 1984 ¹	
07/86		December, 1986	
09/86	\$3,500 million ²		
12/86		1987	undetermined ³
09/88	\$3,600 million	December, 1990	\$1,142 million ⁴
06/89	\$3,980 million*		\$1,030 million ⁵
09/89	\$4,200 million	Late, 1991	\$979 million ⁶
11/90	\$5,017 million	1992 ⁷	\$1,000 million ⁸
01/91		1992 ⁹	
09/91	\$5,151 million ¹⁰		800-1,000 million ¹¹
07/92		1994	
09/92	\$5,600 million	Late, 1993 ¹²	\$450-550 million ¹³
01/93		January, 1994	
03/93		April, 1994	
10/93	\$6,100 million	late fall, 1994	\$500-550 million ¹⁴

¹ Nuclear Regulatory Commission. SER for Watts Bar. pg. A-2.² Source: Tennessee Valley Authority, Office of Engineering, September, 1986³ Source: Letter to Mr. Joseph Kriesberg, Critical Mass Energy Project from Craven Crowell, Director of Information, December 10, 1986.⁴ "Financial Statements for the Fiscal Year Ended September 30, 1988" TVA; pg. 10-11.⁵ Source: TVA Chart titled "Investments in TVA Nuclear Plants, June 30, 1989"⁶ "Financial Statements for the Fiscal Year Ended September 30, 1989" TVA p. 10-11.⁷ TVA 1990 Financial Statements, pg. 8.⁸ Source: TVA, "Responses to TVEC" Ian McLeod⁹ TVA Integrated Resource Plan, 1991, pg. vii. and Presentation packet made for the Tennessee Valley Energy Reform Coalition by the TVA Finance Department. 9/21/90¹⁰ Source: TVA, "Response to TVEC questions: June 2, 1992.¹¹ TVA Information Statement, April 9, 1992. pg. 18.¹² NRC, Meeting Summary - March 24, 1992, Management Meeting on Licensing Status, Docket Nos. 50-390 and 391 April 1, 1992.b¹³ TVA Information Statement, June 4, 1993 pg. 13.¹⁴ TVA Information Statement, December 8, 1993.

Decommissioning Funds

Between 1982 and 1984, TVA invested a total of about \$70 million in a decommissioning fund. In 1992, this fund had a value of about \$230 million. According to TVA, the agency's objective is to provide for enough funds — recovering costs from ratepayers along the way — to decommission its nuclear units upon their retirement. Before 1990, TVA was charging about \$18 million per years to ratepayers for decommissioning costs. TVA was able to suspend decommissioning charges in 1990 as a result of NRC's decision to run a plant's license period (40 years) from the date of commercial operation rather than the date construction began. This effectively extended the license periods for Sequoyah and Browns Ferry about 10 years. TVA expects to resume funding for decommissioning in 1995.¹⁵

¹⁵ Source: TVA, Response to Tennessee Valley Energy Reform Coalition questions dated June 2, 1992

Senior Resident Inspector Comments

- It does not appear that TVA has solved the 1990 work control problems based on recurring problems in management, work control, ownership and leadership.
- Modifications and Engineering are not functioning the way that they should.
- There is no difference today than in 1990 except a year was wasted.
- Watts Bar continues on a roller coaster cycle for fixing problems.
- Mr. Walton is not comfortable that this will not happen again.
- Programs in place are not working. As long as NRC continues to do work, Watts Bar will not get a license.
- Mr. Walton is not confident that the Master Tracking System (MTS) works.
- Mr. Walton believes Watts Bar is kidding itself by concentrating on systems. Victories occur by system and not overall. At this rate, it will take 2 to 5 years to startup Unit 1.
- In 7 1/2 years, Mr. Walton said he had not seen problems such as flex conduit fixed.
- Mr. Walton may request a meeting at the Region II headquarters to talk about these problems. If NRC has to get involved, it may end up shutting the plant down for another year.

Closing Remarks:

- WBSA930153 corrective action for acceptance is good. Corrective actions should be completed prior to restart. QA should be involved.
- What is your schedule date for restart?

NAME	Jon Christensen		DATE	10/13/93	
FO			DATE		
OM			DATE		
NAME	Rob Brown		DATE	8/95	
FO			DATE		
OM			DATE		
TEL			DATE		
CALL			DATE		

*Do you agree that there
are certain comments*

NUCLEONICS WEEK

Vol. 34 No. 45 November 11, 1993

TOP NRC OFFICIAL LACKS CONFIDENCE IN LATEST WATTS BAR STARTUP DATE

The Tennessee Valley Authority (TVA) last month conceded its timetable for obtaining a low-power license for Watts Bar-1 has slipped again—this time to the late summer or early fall of 1994. TVA had planned to load fuel in the 1,177-MW Westinghouse PWR next April (NW, 22 July, 6).

But Thomas Murley, executive director of operations for NRC's Office of Nuclear Reactor Regulation, chided utility officials at a management meeting October 19 for being too vague on their licensing readiness schedule, according to Watts Bar senior project manager Peter Tam and others in attendance.

Sources said that at the Watts Bar management meeting, TVA acknowledged that it needed more time to complete necessary work inside containment and to resolve a number of work issues before it will be ready to load fuel in the reactor.

But Murley told TVA he had little confidence in the new schedule for starting up Watts Bar-1, which has been under construction since 1973. It was on the verge of loading fuel in 1985 and has cost TVA \$6.1-billion to build and fix as of September 30. Martocci said the federal utility anticipates spending \$300-million more to finish the unit, which includes some common facilities with unit 2.

In July, after TVA slipped its timetable for obtaining a low-power license for unit 1 from January to April 1994, TVA extended its contract with Ebasco Constructors, Inc. to complete the unit. Ebasco said the extension was worth

\$203-million, almost double the original \$113-million pact it inked with TVA in 1991. No more supplements have been signed since TVA announced its latest new startup target, TVA and Ebasco officials said.

In a November 1 memo summarizing the October 19 meeting, Tam said Murley urged TVA to provide a more precise date for startup to ensure timely completion of activities that require NRC inspection, such as audits of Watts Bar's equipment qualification program and detailed control room design review. TVA's target for hot functional testing at Watts Bar-1 has moved from November 1993 to March 1994 and the containment integrated leak rate test is now set for May 1994, Tam's summary noted.

TVA said it rescheduled Watts Bar-1 fuel loading so that it could spread out financial obligations over a longer period of time, permit TVA to complete all major construction and modification work inside containment before hot functional testing begins, and increase efficiency by limiting the number of craft workers on site.

Separately, internal TVA notes from a recent meeting between TVA officials and Glenn Walton, NRC's senior resident inspector at the site—circulated at the plant on October 13 and made public by the Knoxville, Tenn. pressure group The Foundation for Global Sustainability—paints a bleak picture of the utility's ability to deal with recurring problems in management, work control, and leadership at Watts Bar.

Walton referred phone calls to NRC's public affairs office, which confirmed the accuracy of the memo summary provided by the pressure group. TVA spokeswoman Barbara Martocci acknowledged the memo's existence.

The notes summarizing Walton's comments on the Watts Bar construction program say that TVA officials are continuing on a "roller coaster cycle" for fixing problems at Watts Bar; that modifications and engineering work at the plant are not functioning properly; that programs are not working; and that as long as "NRC continues to do work, Watts Bar will not get licensed."

The notes say that Walton is not confident that the plant's master tracking system works. He noted TVA officials are "kidding" themselves by concentrating on fixing overall systems instead of individual plant systems one at a time. "At this rate, it will take two to five years to start up unit 1," the notes say Walton said.

—Richard R. Zuercher, Washington

Enclosure 4

TVA Nuclear: Reliability**TVA's Nuclear Power Program**

TVA began an ambitious nuclear plant construction program in 1966 to meet projected system load growth. At the height of the construction program, TVA had 17 nuclear units either under construction or in commercial operation at seven plant sites. In August, 1982, because of lower-than-expected load growth, TVA canceled construction of four nuclear units. In August 1984, four more units were canceled. Total investments in the eight units at the time of cancellation was \$4.6 billion. All of this amount had been written off by September 30, 1990. ¹

Today, TVA's nuclear power program consists of nine reactors. Reactors with operating licenses include three reactors at the Brown's Ferry nuclear plant and two reactors at the Sequoyah nuclear power plant. Plants under construction include two reactors at the Watts Bar nuclear plant and two reactors at the Bellefonte nuclear plant. The current status of each plant as of February, 1994 are listed below:

Brown's Ferry 1 — Administrative hold
Brown's Ferry 2 — Operation
Brown's Ferry 3 — Administrative hold

Sequoyah 1 — Operation
Sequoyah 2 — Operation

Watts Bar 1 — Under construction
Watts Bar 2 — Deferred status

Bellefonte 1 — NRC allowed TVA to restart of engineering in fall of 1993
Bellefonte 2 — NRC allowed TVA to restart of engineering in fall of 1993

¹ TVA Information Statement, December 8, 1993, pg 9.

RELIABILITY

Capacity Factor:

The ratio of the gross electricity generated, for the period of time considered, to the energy that could have been generated at continuous full-power operation during the same period listed by percentage below.

Cumulative Lifetime Capacity Factors for all five TVA nuclear power plants with operating licenses.

CAPFAC gives lifetime capacity factor through that year

MW = original net design rating

VINT = date of declared commercial operation, in decimal form

FWH = net kilowatt-hours in billions

CPIS = date construction permit was issued by AEC, also decimalized

(Note that CAPFAC reflects leap years.)

N	UNIT	NUM	MW	VINT	AGEYR	GWH	CAPFAC	CFCUME
66	BFERRY-1	7	1098	74.58	1	75	1348	14.01
67	BFERRY-1	7	1098	74.58	2	76	1301	13.49
68	BFERRY-1	7	1098	74.58	3	77	5043	52.43
69	BFERRY-1	7	1098	74.58	4	78	5818	60.49
70	BFERRY-1	7	1098	74.58	5	79	7496	77.93
71	BFERRY-1	7	1098	74.58	6	80	6062	62.85
72	BFERRY-1	7	1098	74.58	7	81	4405	45.80
73	BFERRY-1	7	1098	74.58	8	82	7881	81.94
74	BFERRY-1	7	1098	74.58	9	83	2176	22.62
75	BFERRY-1	7	1098	74.58	10	84	7848	81.37
76	BFERRY-1	7	1098	74.58	11	85	1543	16.04
77	BFERRY-1	7	1098	74.58	12	86	0	0.00
78	BFERRY-1	7	1098	74.58	13	87	0	0.00
79	BFERRY-1	7	1098	74.58	14	88	0	0.00
80	BFERRY-1	7	1098	74.58	15	89	0	0.00
81	BFERRY-1	7	1098	74.58	16	90	0	0.00
82	BFERRY-1	7	1098	74.58	17	91	0	0.00
83	BFERRY-1	7	1098	74.58	18	92	0	0.00
84	BFERRY-1	7	1098	74.58	19	93	0	27.84
85	BFERRY-2	8	1098	75.17	1	76	1567	16.25
86	BFERRY-2	8	1098	75.17	2	77	6225	64.72
87	BFERRY-2	8	1098	75.17	3	78	5547	57.67
88	BFERRY-2	8	1098	75.17	4	79	7441	77.36
89	BFERRY-2	8	1098	75.17	5	80	5619	58.26
90	BFERRY-2	8	1098	75.17	6	81	7472	77.68
91	BFERRY-2	8	1098	75.17	7	82	4451	46.28
92	BFERRY-2	8	1098	75.17	8	83	6386	66.39
93	BFERRY-2	8	1098	75.17	9	84	4044	41.93
94	BFERRY-2	8	1098	75.17	10	85	0	0.00
95	BFERRY-2	8	1098	75.17	11	86	0	0.00
96	BFERRY-2	8	1098	75.17	12	87	0	0.00
97	BFERRY-2	8	1098	75.17	13	88	0	0.00
98	BFERRY-2	8	1098	75.17	14	89	0	0.00
99	BFERRY-2	8	1098	75.17	15	90	0	0.00
100	BFERRY-2	8	1098	75.17	16	91	3759	39.08
101	BFERRY-2	8	1098	75.17	17	92	8389	86.96
102	BFERRY-2	8	1098	75.17	18	93	60	38.48

103 BFERRY-3	9	1098	77.17	1	78	5554	57.74	57.74
104 BFERRY-3	9	1098	77.17	2	79	5483	57.00	57.37
105 BFERRY-3	9	1098	77.17	3	80	6937	71.92	62.22
106 BFERRY-3	9	1098	77.17	4	81	6265	65.14	62.95
107 BFERRY-3	9	1098	77.17	5	82	4893	50.87	60.54
108 BFERRY-3	9	1098	77.17	6	83	5394	58.08	59.79
109 BFERRY-3	9	1098	77.17	7	84	291	3.02	51.68
110 BFERRY-3	9	1098	77.17	8	85	1468	15.26	47.13
111 BFERRY-3	9	1098	77.17	9	86	0	0.00	41.89
112 BFERRY-3	9	1098	77.17	10	87	0	0.00	37.70
113 BFERRY-3	9	1098	77.17	11	88	0	0.00	34.28
114 BFERRY-3	9	1098	77.17	12	89	0	0.00	31.42
115 BFERRY-3	9	1098	77.17	13	90	0	0.00	29.00
116 BFERRY-3	9	1098	77.17	14	91	0	0.00	26.93
117 BFERRY-3	9	1098	77.17	15	92	0	0.00	25.14
118 BFERRY-3	9	1098	77.17	16	93		0	23.56

Browns Ferry Station as a Whole

30.16

1253 SEQ-1	89	1148	81.50	1	82	4909	48.81	48.81
1254 SEQ-1	89	1148	81.50	2	83	7341	73.00	60.91
1255 SEQ-1	89	1148	81.50	3	84	8105	60.54	60.78
1256 SEQ-1	89	1148	81.50	4	85	4081	40.38	55.68
1257 SEQ-1	89	1148	81.50	5	86	0	0.00	44.55
1258 SEQ-1	89	1148	81.50	6	87	0	0.00	37.12
1259 SEQ-1	89	1148	81.50	7	88	67	0.67	31.91
1260 SEQ-1	89	1148	81.50	8	89	9551	94.97	39.80
1261 SEQ-1	89	1148	81.50	9	90	6825	67.87	42.92
1262 SEQ-1	89	1148	81.50	10	91	7268	72.27	45.85
1263 SEQ-1	89	1148	81.50	11	92	8357	82.88	49.22
1264 SEQ-1	89	1148	81.50	12	93		13	46.20
1265 SEQ-2	90	1148	82.42	1	83	6691	66.53	66.53
1266 SEQ-2	90	1148	82.42	2	84	6403	63.50	65.02
1267 SEQ-2	90	1148	82.42	3	85	5811	55.79	61.94
1268 SEQ-2	90	1148	82.42	4	86	0	0.00	46.46
1269 SEQ-2	90	1148	82.42	5	87	0	0.00	37.17
1270 SEQ-2	90	1148	82.42	6	88	3883	38.51	37.39
1271 SEQ-2	90	1148	82.42	7	89	6057	60.23	40.65
1272 SEQ-2	90	1148	82.42	8	90	7178	71.37	44.49
1273 SEQ-2	90	1148	82.42	9	91	9319	92.67	49.84
1274 SEQ-2	90	1148	82.42	10	92	7270	72.10	52.07
1275 SEQ-2	90	1148	82.42	11	93		20	49.15

Sequoyah Station as a Whole

47.61

All 5 TVA Nuclear Units as a Whole (approx - not weighted by MW)

35.44

Brown's Ferry nuclear power plant: yearly capacity factors

	<u>1990</u> capacity factor	<u>1991</u> capacity factor	<u>1992</u> capacity factor	<u>1993*</u> capacity factor
Unit 1	0	0	0	0 ²
Unit 2	0	40.3%	89.7%	58.2%
Unit 3	0	0	0	0

* 1993 yearly factor does not include December, 1993.

Source: Nuclear Regulatory Commission, Monthly Operating Reports for December 1990, 1991, 1992 and November 1993.

Sequoyah nuclear power plant: yearly capacity factors

	<u>1990</u> capacity factor	<u>1991</u> capacity factor	<u>1992</u> capacity factor	<u>1993*</u> capacity factor
Unit 1	67.9%	73.9%	84.8%	13.0%
Unit 2	71.4%	94.8%	73.8%	18.5%

* 1993 yearly factor does not include December, 1993.

Source: Nuclear Regulatory Commission, Monthly Operating Reports for December 1990, 1991, 1992 and November 1993.

² Nuclear Regulatory Commission: Monthly Operating Reports submitted from the Tennessee Valley Authority for February, 1993, November, 1993, December, 1992, December 1991; December 1990.

CORPORATE

Financial statistics**

(Mil. \$)	1989*	1988*	1989	-Year ended Dec. 31-		
				1988	1987	1986
Net inc. from cont. oper.	218.5	(94.7)	(37.0)	350.0	313.0	277.5
Funds from oper. (FFO)	126.9	378.9	447.2	897.3	808.2	847.9
Capital expenditures	350.0	438.0	577.0	651.0	642.1	629.7
Total debt	2,870.0	2,540.0	2,862.0	2,083.1	1,870.4	1,337.8
Shareholders' equity	3,530.0	3,250.0	3,287.0	3,106.0	2,960.0	2,844.8
Oper. inc. % of sales	4.8	4.8	5.4	6.5	7.7	7.8
Pretax interest cov. (x)	0.76	0.43	0.64	2.97	3.72	4.52
FFO/total debt (%)	3.5	25.0	15.6	33.5	41.0	63.4
Pretax return on perm. capital (%)	5.0	6.3	4.5	14.4	13.4	14.7
Total debt/capital (incl. \$70) (%)	45.0	43.9	46.5	39.9	39.8	32.0

*For nine months ended Sept. 30.

**Annual figures adjusted to capitalize operating leases.

Interest ratios may not be directly comparable to those for annual periods, reflecting information limitations.

creased debt by about \$400 million. In the intermediate term, operating cash flow should gradually improve due to lower working capital requirements of commercial and defense operations and increasing deliveries of the MD-11. These factors, coupled with greater operating efficiencies, should also bolster earnings. Although expected improvements should strengthen the capital structure and cash flow, financing requirements in the longer term could rise to support development of expensive new commercial aircraft and defense programs now in the competition stage.

TENNESSEE VALLEY AUTHORITY

S&P Contacts: Arnette Wogan (212) 208-1939, Barbara A. Eseman (212) 208-1656

RATING AFFIRMED

OUTSTANDING RATING

\$9.38 billion publicly issued senior debt

AAA

plans at this time to do so, this gives TVA flexibility should rates need to be raised.

OUTLOOK: NEGATIVE

RATIONALE Tennessee Valley Authority's (TVA) rating reflects the implicit support of the U.S. government. TVA is a wholly owned government corporation and its debt is accounted for on the U.S. budget. The "agency status" of debt issued in the capital markets and continued access to the Federal Financing Bank (FFB) further evidences support. Access to the FFB is up for renewal this year. TVA may request renewal of the agreement, but the decision to renew rests with the FFB. S&P's negative outlook reflects this event. S&P will monitor the situation to determine whether there is any

ISSUER TVA is organized into three operating groups: the Generating Group, which is responsible for production of electric power; the Customer Group, which handles the transmission system and sale of electricity; and the Resource Group, which is concerned with natural resource and economic development issues. The Resource Group, or nonpower side of TVA, is primarily funded through Congressional appropriations. TVA appears before Congressional committees each year to discuss its appropriation request. Thus, there is an annual oversight and discussion of TVA activities. While these appropriated funds do not affect power operations, all of TVA's activities can be discussed at these hearings and provide insights into Congressional support.

In October 1989, the FFB extended TVA's credit line for two years. TVA had funded itself exclusively through the FFB since the FFB's inception in the mid-1970s. It is FFB's policy that agencies which use the FFB for funding do not at the same time access the public markets. Thus, in 1989 when TVA announced its intention to access the public market, the FFB announced that TVA could no longer borrow from it. A resulting agreement allowed TVA to borrow from the FFB for a two-year period which expires this October. Under the agreement, TVA may request an extension to the FFB access this year, and FFB will decide whether or not to extend. Because access to the FFB is considered an evidence of support, any change in access must be evaluated for importance to the level of federal support. S&P will monitor the situation to determine whether there is any change to government support as a result of this situation.

change to government support as a result of this situation. TVA is required by its authorizing legislation to charge its customers rates which cover debt service. Today, TVA's rates are below the national average. Its legislation also gives TVA's board of directors the authority to raise rates without review by any state or federal regulators. While TVA has not raised rates in three years and has no

BUSINESS TVA has made substantial progress in strengthening its overall financial condition and resolving many of its operational woes. Despite three years of stable rates, pretax interest coverage

Financial statistics

(Mil. \$)	1989	1988	1988	-Year ended Sept. 30-		
				1987	1986	1985
Funds from operations (FFO)	1,198.0	940.0	480.2	503.1	294.3	108.0
Dividends	96.0	87.0	80.0	94.0	108.0	108.0
Net cash flow (NCF)	1,107.0	853.0	371.2	409.1	186.3	186.3
Capital expenditures (capex)	1,126.0	929.0	1,068.0	951.0	925.0	925.0
Total capital (mil. \$)	24,879.0	24,885.0	24,588.7	23,175.6	21,782.1	21,782.1
Short-term debt (%)	1.8	4.1	5.1	1.0	3.4	3.4
Long-term debt (%)	94.3	79.7	80.8	84.5	83.6	83.6
Preferred stock (%)	0.0	0.0	0.0	0.0	0.0	0.0
Common equity (%)	14.1	16.1	14.3	13.7	13.0	13.0
Pretax interest coverage (x)	1.89	1.46	1.28	1.08	0.97	0.97
Preferred div. coverage (x)	1.89	1.46	1.28	1.08	0.97	0.97
Return on avg. equity (%)	10.8	16.4	4.1	(2.1)	(18.6)	(18.6)
AFD/common earnings (%)	(22.8)	(8.8)	78.2	113.8	191.9	191.9
Common div. payout (%)	(22.7)	15.0	21.5	25.0	30.0	30.0
Capex/avg. total cap. (%)	4.5	3.8	4.8	4.2	4.3	4.3
FFO int. coverage (x)	1.42	1.38	0.94	0.98	0.94	0.94
FFO/avg. total debt (%)	5.7	4.5	2.2	2.8	3.1	3.1
NCF/capex (%)	98.1	91.8	34.1	43.0	20.3	20.3

RATING ANALYSES

has risen to 1.9 times, and cash flow currently is funding construction expenditures in their entirety. The improvement can be traced to the refinancing of high-coupon FFB debt, which significantly reduced interest expense, aggressive cost controls, and higher sales volumes. These factors are expected to aid TVA in holding rates level for another year. However, accelerating capital outlays for nuclear operations and additional expenditures to comply with Clean Air Act revisions may necessitate external funding, resulting in possible rate relief pressures during the early to mid-1990s. The capital structure remains highly leveraged, with total debt approximating 85%. The 15% equity layer in part reflects the \$900 million write-down of the unamortized balance of cancelled nuclear plants taken in 1990.

A chief uncertainty was eliminated last year when TVA's largest customer, Memphis Light, Gas & Water announced that it will continue to purchase its full energy requirements from TVA. Given TVA's competitive rates, no other major distributors are expected to leave the TVA power system. Moreover, most large customers have contracts that require a 10-year termination notice.

On the nuclear front, considerable progress has been made. Both Sequoyah units 1 and 2 have had solid availability and capacity factors since their return to service in mid-1988 and early 1989, respectively. The Nuclear Regulatory Commission's

(NRC) Systematic Assessment of Licensee Performance (SALP) report for Sequoyah, which covered the July 1989 through March 1990 period, was favorable with all seven areas awarded category 2 rankings. Fuel currently is being loaded at Browns Ferry unit 2, with commercial operation slated for later this year. Restart of units 3 and 1 at Browns Ferry is scheduled for late 1993 and winter 1996, respectively. While the Browns Ferry SALP report contained two category 3 rankings, improving trends were noted. The Browns Ferry station remains in a special NRC category of shutdown plants requiring NRC authority to restart and which the NRC will monitor closely. Watts Bar Unit 1 is substantially complete with operation planned for 1992. Construction on Watts Bar unit 2 and Bellefonte units 1 and 2 will potentially resume when the power is needed. However, nuclear construction risk is high, given technical, regulatory, and environmental challenges. TVA may experience lengthy delays and cost overruns in bringing its remaining nuclear units into service, which could adversely impact its financial profile. Moreover, although two of TVA's nine nuclear plants are now on-line and running well, the operation of nuclear facilities has proved to be a special challenge for most utilities. Accordingly, the risk to the government is at the lower end of the investment grade category.

STRUCTURED FINANCE

CHEMICAL BANK CREDIT CARD TRUST 1988-B

S&P Contact: Susan Wisulko (212) 208-8288

RATING AFFIRMED

OUTSTANDING RATING

\$500 million 9.25% certificates AAA

RATIONALE Chemical Bank Credit Card Trust 1988-B's certificates were originally issued on Oct.

Pool performance statistics

Chemical Bank Credit Card Trust 1988-B

	Year 1 avg. (%)	Year 2 avg. (%)
Yield	19.85	20.87
Gross charge-offs	4.08	3.54
Servicing fee	1.10	1.10
Average monthly surplus yield (MSY)	5.22	6.98
Maximum MSY	7.04	11.00
Minimum MSY	2.93	5.18
Payment rate	18.20	14.79

Chemical Bank Credit Card Trust 1988-A

	Year 1 avg. (%)	Year 2 avg. (%)
Yield	19.80	21.12
Gross charge-offs	3.00	3.51
Servicing fee	1.10	1.10
Average monthly surplus yield (MSY)	8.20	7.21
Maximum MSY	8.20	10.83
Minimum MSY	4.08	5.02
Payment rate	17.40	15.41

5, 1988 and represent an undivided interest in a randomly selected pool of receivables generated on eligible Visa and MasterCard accounts issued by Chemical Bank. Eligibility criteria eliminated any

charged-off, bankrupt, deceased, or lost/stolen card accounts at the cut-off date. Gross charge-offs, despite trending up by almost 36% in the past five months, have performed well within the 'AAA' level. Portfolio yield has been sufficient to cover all losses and expenses. No draw on the pool's 11% letter of credit (LOC) has been necessary. Over its 29-month life (through January 1991), the 1988-B portfolio has experienced average gross charge-offs of 3.97%. The \$350 million Chemical Bank Credit Card Trust 1988-A certificates paid off in accordance with their terms in November 1990. These certificates had a 22-month interest-only period, followed by a six-month amortization period. Gross charge-offs for the 1988-A pool averaged 3.4% over its 28-month life. (For pool performance statistics, see table.)

STRUCTURE The 1988-B transaction is structured with two classes of certificateholders, investor and seller. Credit support is provided via an 11% LOC issued by the Union Bank of Switzerland. The transaction provides for a 22-month interest-only period during which investors receive monthly distributions of interest at the 9.25% certificate rate. This interest-only period is followed by a maximum 38-month amortization period when both interest and principal will be passed through to

Tennessee Valley
Industrial Committee

TVIC

TESTIMONY

Of the
Tennessee Valley Industrial Committee
and
Associated Valley Industries

Presented by Tim Soles, Amoco Chemical Company
to the
Investigations and Oversight Subcommittee
of the
U.S. House of Representatives
Committee on Public Works and Transportation

March 9, 1994

Mr. Tim Soles, Chairman
Tennessee Valley Industrial Committee
c/o Amoco Chemical Company
2525 Bay Area Blvd., Suite 450
Houston, TX 77058
(713) 280-5546

Mr. Ron Fogel, Executive Director
Associated Valley Industries
c/o Fogel & Associates
P. O. Box 2058
Columbia, TN 38402
615/381-7402

Mr. John Van Mol
TVIC Staff Director
c/o Dye, Van Mol & Lawrence
209 7th Avenue North
Nashville, TN 37219
615/244-1818

Thank you, Mr. Chairman. As you indicated, my name is Tim Soles, and I work for Amoco Chemical Company based in Houston, Texas, in the company's energy management group. My appearance today, however, is in behalf of industrial electric customers of TVA throughout the TVA service area. The industrial organizations I represent were formed specifically for the purpose of working with TVA on assuring a reliable, efficient electric energy supply at the lowest possible cost, consistent with meeting various environmental requirements. TVA policies on electricity supply and prices obviously have a direct impact on our companies, and we are grateful for the opportunity to share our views on the subject areas and issues you are examining. With your permission, I will proceed with a brief oral summary of my testimony and then we will do our best to answer any questions you may have.

The Tennessee Valley Industrial Committee was organized in the early 1970s, and is composed of industries which purchase their electricity directly from TVA. Associated Valley Industries was founded in the early 1980s, and the principal difference between it and TVIC is that AVI member companies buy their power from the various local distributors of TVA power throughout the Valley.

Together, TVIC and AVI include more than 90 separate industrial companies, and upwards of 100,000 jobs at more than 150 manufacturing or operations locations in the Tennessee

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Valley. A list of these companies and Valley plant locations is attached for the subcommittee's information.

To give you a further idea of the scope of our combined operations, my estimate is that these companies together purchase upwards of 20 percent of TVA's electric power output during any given year, to fuel manufacturing operations and provide jobs.

For the last several years and currently, I would describe our working relationship with TVA, at the staff and board levels, as very good. We believe TVA shares our interest in competitive electric rates for the job-producing sector of the economy, and we work very hard together on this issue. As you might expect, we don't always reach the same conclusions, but we believe a good-faith effort at a utility-customer partnership is being made on both sides.

I will now address briefly the other areas in which the subcommittee indicated it would like to hear us, namely, the TVA power program, to include the nuclear program, load forecasting, rates, TVA's debt; its competitiveness; our role in TVA's Integrated Resource Plan and our views on how that process has been set up and is getting under way.

Any discussion of TVA's nuclear program needs to have a bit of historical perspective. More than two decades ago, TVA and many other utilities across the nation began planning and building nuclear generating stations. At the time, with rapidly escalating costs for coal and both domestic and imported oil to

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fuel power plant boilers, nuclear appeared to be the most cost-effective option available.

By the late 1970s and early 1980s, however, it became painfully apparent that many utilities had substantially overestimated demand and therefore their construction programs. This, coupled with unexpectedly high construction costs and continually changing regulatory requirements, prompted many utilities to halt construction of some nuclear projects. TVA, with TVIC and AVI's urging and full support, took the difficult but financially necessary action of cancelling almost half of its nuclear plant construction. Four reactors were cancelled in 1981, another four were scrubbed in 1984, and the remainder which were not yet licensed for operation were put on a stretched-out completion schedule.

Today, TVA's nuclear capability consists of two units at the Sequoyah plant near Chattanooga and one unit at Browns Ferry in north Alabama. A second Browns Ferry unit is due to return to service next year.

Construction activity is ongoing at two other sites -- Watts Bar and Bellefonte. Unit 1 at Watts Bar is virtually complete and scheduled to go into service next year. The second unit there, plus both Bellefonte units and the third unit at Browns Ferry will be considered as future resource options in TVA's integrated resource planning process.

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We have no reason to quarrel with TVA's current load forecast over the 10-year planning horizon; it seems reasonable to us based on our own companies' projections of what individual plants will be doing during that time period, and seems to assume only modest economic growth, certainly not extraordinary growth.

TVA service area industries have not gone on record as either proponents or opponents of nuclear power, nor have we asked TVA to increase its nuclear generating capacity. We would like to think the continued construction of TVA's nuclear plants nearing operational readiness would salvage some of the billions of ratepayer dollars already invested in these units. But, we, like others, do not know if that is a certainty.

We believe the Integrated Resource Planning process will permit a more accurate estimate of the cost effectiveness of completing these units which TVA has informed us are necessary to meet anticipated power demand in the future. Until the Integrated Resource Planning process either validates or invalidates this projection, we would urge TVA to make its existing nuclear completion program a top priority of the Integrated Resource Planning project. I would like to assure this subcommittee that Tennessee Valley industry will cooperate fully in providing our own usage projections and information to TVA as well as an independent economic analysis of TVA's proposed resource addition program.

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Opponents of nuclear power have asserted that perhaps additional conservation in both the residential and industrial sectors would eliminate the need for completing the TVA nuclear plants under construction. Industrial consumers have always supported cost-effective conservation measures, but cannot support social programs, promulgated under the guise of conservation, that increase electric rates. In the extremely competitive environment our industries face -- and in view of the current cost of electricity itself -- I would like to assure the committee that the manufacturing sector as represented by our organizations has made substantial contributions to the conservation effort. For example, the chemical industry reduced energy consumed per unit of output by 32.1 percent between 1974 and 1990, as measured by the Federal Reserve Board index of industrial production.

Since the size of our electric bills influences our economic survival, we simply can't afford to waste energy or use it inefficiently. Throughout our various operations, you'll find energy-efficient technologies and methods of production.

This point leads into a brief discussion of current and future rate levels, and the importance to us of TVA improving its competitiveness with respect to industrial electric rates.

Many of our member-companies are national or international in scope. When corporate headquarters makes a decision where to build new facilities or where to expand existing facilities,

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energy prices are often critical, and sometimes even the deciding, factor.

We believe keeping existing jobs and bringing new jobs to the Valley are important to TVA. We support TVA's efforts to be more competitive with other utilities, and to supply electric power at the lowest practical costs -- whether that energy comes from coal, other fossil fuels, hydro, nuclear, conservation, demand-side management, innovative rate products or any other combination of resources.

Currently, TVA has one of the lowest system average electric rates in the southeastern United States. For example, residential rates average about 5.5 cents per KWH, as opposed to 9 cents per KWH in Houston or -- in Washington, D. C. TVA firm industrial rates do need to be more competitive. I know the TVA Board is aware of this and is considering ways to achieve more competitive industrial rates within their goal of not increasing any customer classes' rates.

I would like to turn now to the issue of TVA's debt -- and address what the subcommittee has referred to in its communications with us as "TVA's increasing debt burden." I would like to try to put that so-called "burden" into some perspective. First, we hope that members of the subcommittee will share our view that debt, in and of itself, is not necessarily bad. For one thing, it can be a very important reflection of growth. If the business is growing, a proportional

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growth in debt is acceptable. In our view, TVA should focus -- and we believe it is -- on a number of areas besides just the total debt figure.

The first focus should be on debt service, to assure that it is at an affordable level.

Second, electricity sales should be continuing to increase, through competitive pricing.

And thirdly, expenses should be under control.

We believe TVA's performance is very acceptable, using these criteria. In the interest of time, I will provide only a "spot-check" example of how TVA has been meeting these criteria. Currently, as of its most recently completed fiscal year, about one-third of every dollar TVA took in went to interest payments -- and that ratio has remained consistent over the past three years. These have been some of TVA's best financial years, so I think it is safe to assume that 32 or 33 cents out of every revenue dollar going to interest expense is not a bad thing, as long as the other criteria I mentioned are met.

What about the growth in interest expense as it relates to revenues? Interest expense from fiscal year 1992 to fiscal 1993 grew by about 3.5 percent, while revenue growth was greater over the same period, about 4.2 percent. This means that TVA was more than covering the increase in interest expense through greater sales, another of those "certain other criteria" I mentioned earlier. How about expense control? Comparing those same two

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years, TVA's operating expense increased by about 2.2 percent from fiscal 1992 to fiscal 1993, about one-half the revenue growth rate, so that would appear to be in good shape, too.

Certainly, the level of TVA debt and how it is managed should be watched, particularly if predicted growth should fail to materialize -- but we are not overly concerned at this point at either the overall amount of TVA debt when compared to its earning power, or the level of its interest payments when compared to its revenues and operating expenses.

The subcommittee also requested our views on how TVA is doing on Integrated Resource Planning. As the subcommittee members know, this is the federally-mandated process under which TVA and all other utilities are examining their options for meeting future power needs, and hopefully arriving at the least-cost options when all pertinent factors are taken into account. As representatives of a large segment of TVA's customers, and a large segment of its power usage, we have been involved very closely with TVA on its IRP process planning for more than a year -- and we anticipate continuing to take an active role as the process itself begins. TVIC and AVI are represented on TVA's Review Group for the IRP process. I have mentioned that electric rates are critical to our manufacturing operations. I also have mentioned that TVA's least-cost options to meet future power demands are equally critical to our future growth and viability.

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So you may rest assured that we will do all we can to assure that an objective determination of the best future options for TVA and its customers is, in fact, made. Thus far, we believe TVA has handled the process appropriately.

I will close by saying we have been pleased with the way Chairman Crowell and his fellow directors Bill Kennoy and Johnny Hayes have continued to be strong supporters of industry and the concept of competitive electric rates. This is one of the principal goals the board adopted early on, and we believe it is a highly appropriate goal. The board is further to be commended for its confirmation of that goal by committing to not raising additional revenue through rate increases for a period of four years. This, too, is good news to industry and all ratepayers.

At the same time, we will be continuing to talk with the TVA board about the need to improve its competitive position including industrial power rates. Our industries face extremely rigorous competition from abroad, from within the U.S., and from other plants within our own companies, so this has to be a priority for us.

Thanks very much for your attention to my statement. We will try to answer any questions you may have.

EXHIBIT #1

TVIC Member Companies and Valley Plant Locations

1. Applied Industrial Minerals Corp.- Pittsburgh, PA
Bridgeport, AL
2. Air Products & Chemicals, Inc.- Allentown, PA
Decatur, AL
Calvert City, KY
3. Aluminum Company of America - Alcoa, TN
4. Amoco Chemical Corp. - Houston, TX
Decatur, AL
5. BASF Corporation - Parsippany, NJ
Enka, NC
Lowland, TN
6. B.F. Goodrich Company - Cleveland, OH
Calvert City, KY
7. BIT Manufacturing - Copperhill, TN
8. Beaulieu of America - Dalton, GA
9. The Carbide/Graphite Group, Inc. - Louisville, KY
Calvert City, KY
10. Champion International Corp. - Courtland, AL
11. Degussa Corporation - Calvert City, KY
12. E. I. duPont de Nemours & Company - Wilmington, DE
New Johnsonville Plant
Memphis Plant
Old Hickory Plant
Chattanooga Plant
13. Eka Nobel, Inc. - Columbus, MS
14. Elf Atochem North America - Calvert City, KY
15. Florida Steel Corp. - Jackson, TN
16. General Motors Corp. - Detroit, MI
Athens, AL
Springhill, TN (Saturn Corp.)
Bowling Green, KY
17. ISP Chemicals - Wayne, NJ
Calvert City, KY
18. Inland Container Corp. - New Johnsonville, TN
19. Kerr-McGee Corporation - Oklahoma City, OK
Hamilton, MS
20. Logan Aluminum Company - Russellville, KY
21. Mead Containerboard - Dayton, OH
Stevenson, AL
22. Mississippi Chemical Company - Yazoo City, MS
Newsprint South - Grenada, MS
23. Monsanto Company - St. Louis, MO
Textiles Plant - Decatur, AL
24. Occidental Chemical Corporation - Dallas, TX
Chemical Plant, Columbus, MS
Phosphorus Plant, Columbia, TN
Chlor-Alkali Plant, Muscle Shoals, AL
25. Olin Corporation - Stamford, CT
Charleston, TN
Cleveland, TN

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26. Reynolds Metals Company - Richmond, VA
Alloys Plant, Sheffield, AL
Reduction Plant, Sheffield, AL
27. Rhone-Poulenc Basic Chemicals Company - Shelton, CT
Mt. Pleasant, TN
Nashville, TN
28. SKW Alloys, Inc. - Calvert City, KY
29. A. E. Staley Mfg. Co. - Decatur, IL
Loudon, TN
30. Texas Eastern - Houston, TX
Pumping Station - Egypt, MS
Pumping Station - Gladeville, TN
Pumping Station - Mt. Pleasant, TN
Pumping Station - Thompsonville, KY
Pumping Station - Barton, AL
31. Union Carbide Corporation - Danbury, CT
Carbon Products Div. - Columbia, TN
Carbon Products Div. - Clarksville, TN
32. Union Zinc Company - Clarksville, TN
33. Weyerhaeuser Company - Tacoma, WA
Columbus, MS

Company Name Phone Number	Company Rep. Title	Plant Locations
3M Specialty Materials (205)552-6222	Mr. Patrick R. Debs Maint. Elec. Engineer	Decatur (2)
Akzo Industrial Fibers, Inc (205)574-7230	Mr. Steve Howell Purchasing Agent	Scottsboro, AL Rock Hill, TN
American Limestone Company (615)573-4501	Mr. Robert A. Sells	Knoxville, TN (9) Springfield, TN Watauga, TN Pleasant View, TN Blountville, TN Goodlettsville, TN (2) Unicoi, TN Abingdon, VA
American Magotteaux Corp. (615)363-7471	Mr. Bob Lanier	Nashville, TN Pulaski, TN
American Maize-Products Dec (205)355-8815	Mr. Herman A. Paasch V.P. Operations	Decatur, AL
Bridgestone/Firestone (615)668-5600	Mr. Bob Walsh Plant Manager	Morrison, TN
Bunge Edible Oil Corp. (615)821-3511	Mr. Ralph Meissner Plant Engineer	Chattanooga, TN
C.E. Minerals (615)639-6891	Mr. Kenneth R. Jones V.P. of Operations	Greeneville, TN
Camden Casting Center (901)584-4691	Mr. Jim Gonzales Plant Engineer	Camden, TN
Chattem, Inc. (615)821-4571	Mr. Robert M. Boyd V.P.-General Mgr.	Chattanooga, TN
Chemetals, Inc. (615)535-2151	Mr. C.E. Cunningham Dir.-New Johnsonville	New Johnsonville, TN
Columbia Specialties, Inc. (615)381-2200	Mr. Jim Fogg General Manager	Columbia, TN
Dixie Cement Company, Inc. (615)522-1171	Mr. Ken Hack Maintenance Manager	Knoxville, TN
Dixie Yarns, Inc. (615)493-7286	Mr. Don Huffman Dir. of Engineering	Chattanooga, TN Ringgold, GA Lupton City, TN
E.I. du Pont de Nemours and	Mr. Daryl T. Dauer	New Johnsonville, TN

AVI MEMBER LIST

Page 2

Company Name Phone Number	Company Rep. Title	Plant Locations
(713)293-3760	Coordinator-Gas Supply	Memphis, TN Old Hickory, TN Chattanooga, TN
Eaton Corporation (216)523-6746	Mr. Don Densmore Corp. Energy Co-ord.	Cleveland, TN Glasgow, KY Athens, AL Bowling Green, KY Humbolt, TN Arab, AL Shelbyville, TN
Florida Steel Corporation (615)546-0102	Mr. Tom Rose	Knoxville, TN Jackson, TN
Ford Motor Co. Glass Plant (615)350-7601	Mr. James Richards Project Engineer	Nashville, TN
Franklin Industrial Mineral (615)259-4222	Mr. Nelson Severinghaus, J President	Crab Orchard, TN Anderson, TN
General Electric Company (615)381-2340	Mr. Tom Webster Facilities Engineer	Columbia, TN Decatur, AL Murfreesboro, TN Hendersonville, TN
General Motors Corporation (313)556-3294	Mr. Darrell Anderson Staff Engineer	Spring Hill, TN Tuscaloosa, AL Athens, AL Bowling Green, KY
Goodyear Tire & Rubber Co. (205)340-2230	Mr. Dick Irons Elec. Proj. Engineer	Decatur, AL Union City, TN Calhoun, GA Madisonville, KY
J.M. Huber Corporation (615)263-2241	Mr. Benjamin S. Hall, Jr. Purchasing Supervisor	Etowah, TN
Jersey Miniere Zinc (615)552-4200	Mr. Dave Rice President	Clarksville, TN Gordonsville, TN Elmwood, TN Carthage, TN Jefferson City, TN Thorn, TN
MAHLE, Inc. (615)581-6603	Mr. Nat H. Copenhaver, Jr. Materials Manager	Morristown, TN
Magic Chef, Inc.	Mr. Don Lofty	Cleveland, TN

AVI MEMBER LIST

Company Name Phone Number	Company Rep. Title	Plant Locations
(615) 478-4673	Dir.-Plt. Eng. & Maint	
McKee Foods Corporation (615) 238-7111	Ms. Janet Spraker Utilities Engineer	Collegedale, TN (2)
Modern Forge/Tennessee (615) 282-0327	Mr. Ron Shrum President & Gen. Mgr.	Piney Flats, TN
Morie Company, Inc. (706) 269-3294	Mr. Larry Coger Southern Opr. Mgr.	Columbus, GA
Mueller Company (205) 878-7930	Mr. Dave Mathis Plant Engineer	Albertville, AL Chattanooga, TN
Muscle Shoals Minerals Co. (205) 370-7106	Mr. David Wells Plant Engineer	Tuscumbia, AL
Nippondenso Tennessee, Inc. (615) 982-7000	Mr. John T. Faulkner, Sr. Facilities Eng./Maint.	Maryville, TN
Nissan Motor Mfg. Corp., US (615) 459-1168	Mr. Jason Vasiliades Section Manager	Smyrna, TN
North American Royalties, I (615) 265-3181	Mr. Hank Faulkner V.P. of Administration	Chattanooga, TN
Opryland, USA (615) 871-6816	Mr. Robert Vaughan Dir. Eng. & Const.	Nashville, TN
Plus Mark, Inc. (615) 639-7878	Mr. Larry Qualls Engineering Manager	Greeneville, TN (2)
Polyken Technologies (205) 891-8318	Mr. Edsel Calhoun Plant Engineer	Albertville, AL
Premier Refractories & Chem (615) 743-4125	Mr. Thomas E. Walters Vice President	Erwin, TN
R.R. Donnelley & Sons (615) 452-5170	Mr. Don Slepski	Gallatin, TN
Springs Industries, Inc. (615) 350-7400	Mr. O.L. Russell Plant Engineer	Nashville, TN
TRW Ross Gear Division (615) 639-8151	Mr. Larry McCracken Plant Engineer	Greeneville, TN Lebanon, TN
Tenn-Luttrell Company (615) 992-3841	Mr. Daniel W. Carroll President	Luttrell, TN

AVI MEMBER LIST

Page 4

Company Name Phone Number	Company Rep. Title	Plant Locations
Textron Aerostructures (615) 360-4077	Mr. Steve Dunn	Nashville, TN
The Murray Ohio Manufacturi (615) 762-0197	Mr. Gerald Harper	Lawrenceburg, TN
The Quaker Oats Company (901) 426-6282	Mr. Greg Eichhorst Engineering	Jackson, TN
Velsicol Chemical Corp. (615) 825-8224	Mr. Ron Burton Utilities Manager	Chattanooga, TN Memphis, TN
Viskase Corporation (312) 496-4638	Mr. Irv Herman Energy Manager	Loudon, TN
W.R. Grace & Company (615) 698-3461	Mr. Cletis Lewis Energy Manager	Chattanooga, TN
Walker Die Casting (615) 359-6206	Mr. John Walker	Lewisburg, TN
William L. Bonnell Company (615) 683-8291	Mr. Bill Wetmore Plant Manager	Carthage, TN
Zinc Products Company (615) 639-8111	Mr. Roy Robinson Chief Engineer	Greeneville, TN

EXHIBIT #3

DRAZEN-BRUBAKER & ASSOCIATES, INC.
REGULATORY AND ECONOMIC CONSULTANTS

TELEPHONE: (314) 878-0900
TELECOMER: (314) 878-2040

VIA: U.S. Mail

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POST OFFICE BOX 412000
ST. LOUIS, MO 63141-2000

October 25, 1993

Mr. Tim Soles
Amoco Chemicals Company
One Corporate Plaza
2525 Bay Area Blvd., Suite 450
Houston, Texas 77058

Mr. Ron Fogel, President
Fogel & Associates
Highway 50, Monsanto Road
P.O. Box 2058
Columbia, Tennessee 38402-2058

Mr. John Van Mol
Dye, Van Mol & Lawrence
209 Seventh Avenue, North
Nashville, Tennessee 37219

Mr. Art Malatzky
Olin Corporation
120 Long Ridge Road
P.O. Box 1355
Stamford, Connecticut 06904-1355

RE: Update to TVIC-AVI Position Paper

Gentlemen:

We have just completed the Drazen-Brubaker survey of power cost in the Southeastern United States for October 1993, and I am enclosing copies of several of the charts we have used in the past. The results present a mixed picture with respect to TVA. The following is a brief run down:

First, you will find interesting the charts that display TVA's rank and illustrate the goal of competitive rates. The July survey had shown improvement in TVA's position as a result of the reduction in TVA rates to reflect the adjustment in the hydro credit. In the October survey, there was movement in the power cost of several of the utilities that were close to TVA in the cost survey and as a result TVA has slipped back to a rank of 21, the position held before hydro adjustment.

Second, the average cost of the lowest cost producers, the highest cost producers and the average cost of all producers on the list all increased somewhat. Consequently, the reduction required in TVA's rates in order to become competitive decreased very slightly. This is interesting since their rank order was worse.

Finally, I thought it was interesting that in the context of all this movement the median cost of the 30 utilities decreased slightly from July to October.

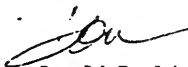
DRAZEN-BRUBAKER & ASSOCIATES, INC.

Mr. Tim Soles
Mr. John Van Mol
Mr. Ron Fogel
Mr. Art Malatzky
October 25, 1993
Page 2

Among the enclosed charts is the revision to Chart 14 from the position paper. I am providing transparencies to Ron and to Woody who I understand has been the custodian of the TVIC transparencies. Please let me know if I can provide any additional information.

Sincerely,

DRAZEN-BRUBAKER & ASSOCIATES, INC.



Donald E. Johnstone

DEJ:tam
#3436

✓ Enclosures

cc: Woody McMillin (Dye, Van Mol & Lawrence)

TENNESSEE VALLEY AUTHORITY

Power Cost Comparison Large High Load Factor Industrial Customers 1980 Through 1993

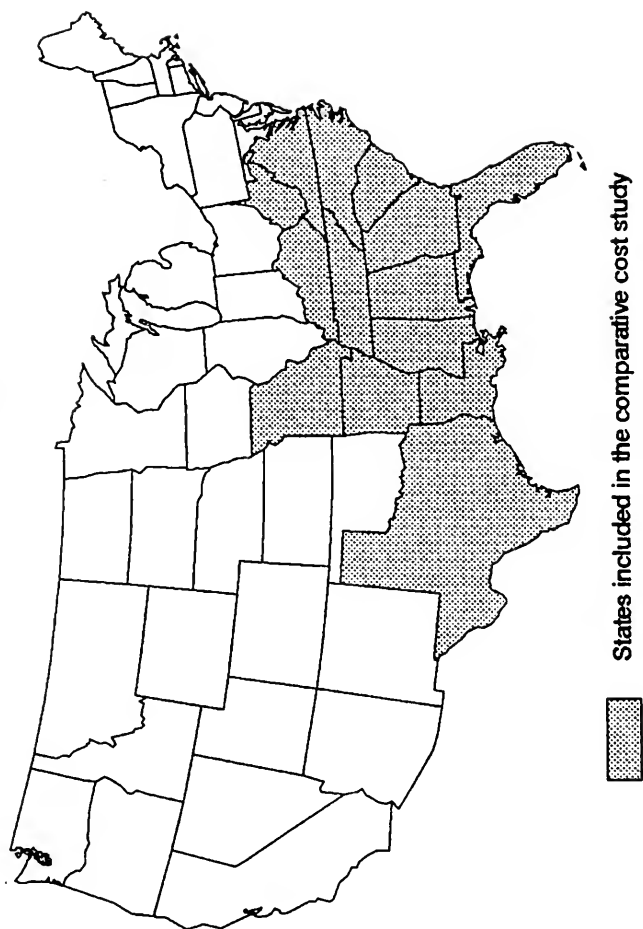


Chart 1

TENNESSEE VALLEY AUTHORITY

Comparative Study of the Cost of Firm Power Delivered
to an Industrial Customer in October of 1993
50,000 kW Load, 90% Load Factor and
90% Power Factor at Transmission Level

<u>Line</u>	<u>Utility Company</u>	<u>Mills per kWh</u>
1	New Orleans Public Service Inc.	54.74
2	Gulf States Utilities Company, LA	54.35
3	Mississippi Power & Light Company	53.89
4	Louisiana Power & Light Company	53.32
5	Tampa Electric Company	52.18
6	Carolina Power & Light Company, NC	49.83
7	Arkansas Power & Light Company, AR	46.13
8	Carolina Power & Light Company, SC	45.66
9	Texas Utilities Electric Company	44.70
10	Florida Power Corporation	43.71
11	Central Power and Light Company	43.56
12	Georgia Power Company	42.93
13	Florida Power & Light Company	42.72
14	Houston Lighting & Power Company	40.98
15	Southwestern Electric Power Company, LA	39.61
16	Central Louisiana Electric Company, Inc.	38.87
17	Virginia Electric and Power Company	38.29
18	Alabama Power Company	38.17
19	Duke Power Company, NC	38.15
20	Union Electric Company, MO	37.92
21	TENNESSEE VALLEY AUTHORITY	37.16
22	Duke Power Company, SC	36.77
23	Gulf Power Company	36.69
24	Gulf States Utilities Company, TX	36.55
25	Louisville Gas and Electric Company	36.03
26	Southwestern Electric Power Company, TX	35.83
27	Mississippi Power Company	35.42
28	Monongahela Power Company, WV	34.65
29	South Carolina Electric & Gas Company	34.03
30	Appalachian Power Company, WV	33.02
31	Appalachian Power Company, VA	29.46
32	Kentucky Power Company	26.12

Survey by Drazen-Brubaker & Associates, Inc.

TENNESSEE VALLEY AUTHORITY

Large High Load Factor Industrial Firm Power Cost
Average Cost per kWh for TVA and a Group of 32 Selected Utilities

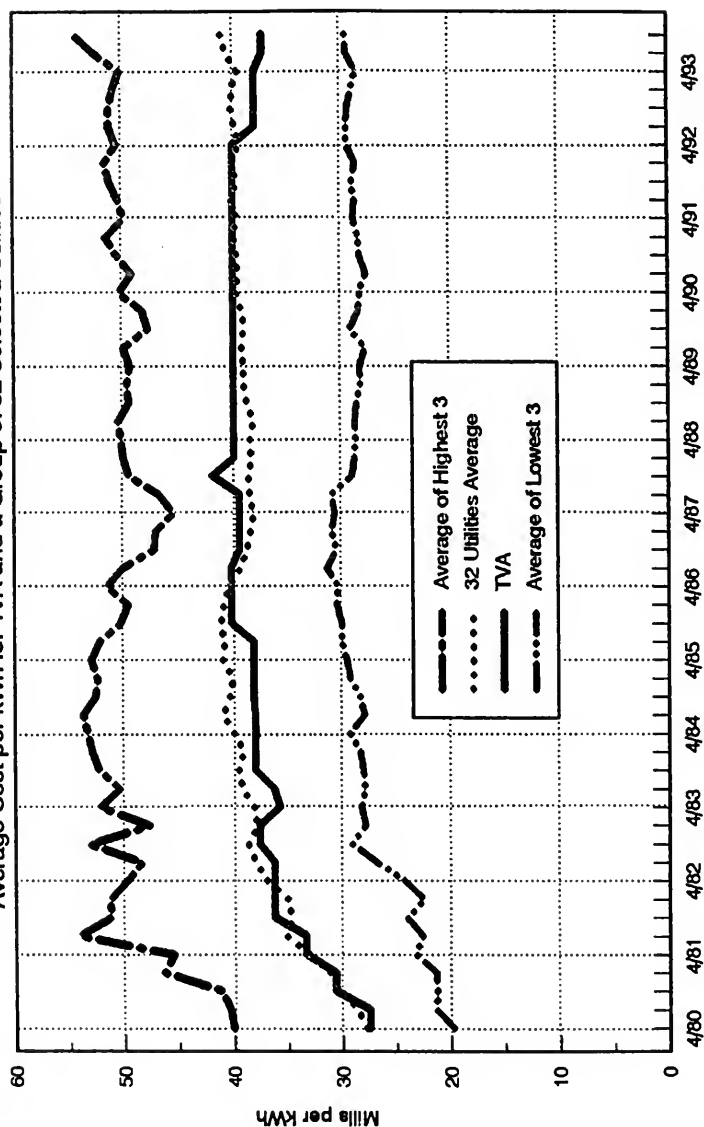
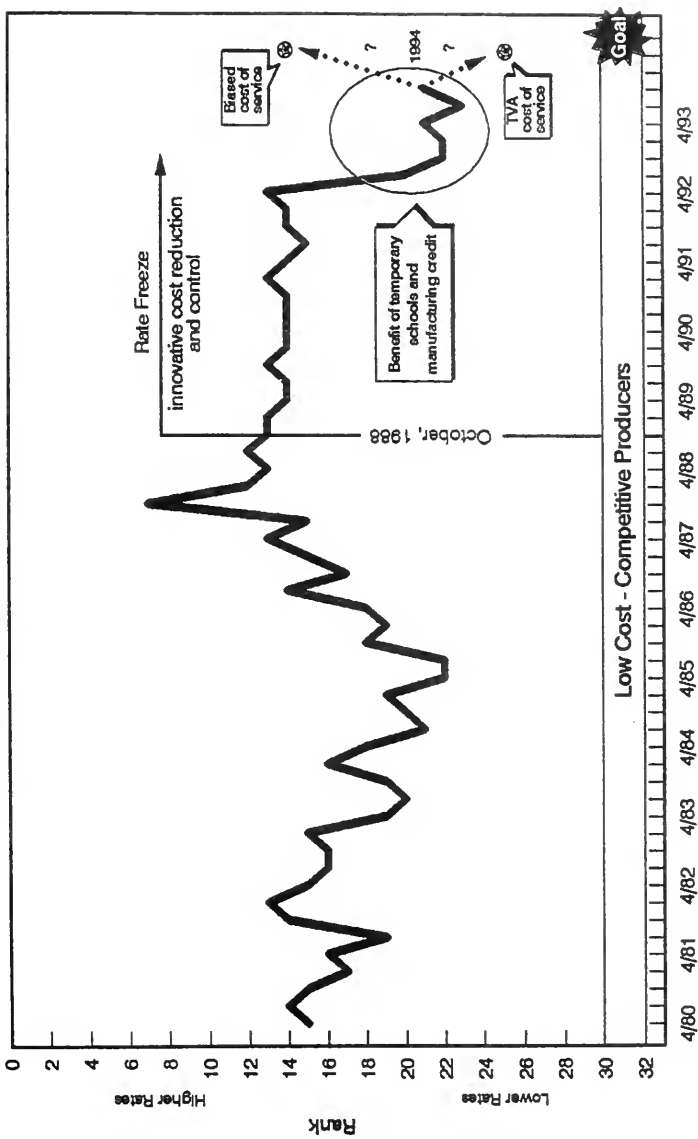


Chart 3

TENNESSEE VALLEY AUTHORITY

Large High Load Factor Industrial Firm Power Cost

TVA Rank in a Group of 32 Selected Utilities



Low Cost - Competitive Producers

Note: A rank of 1 represents the highest cost

Chart 4

TENNESSEE VALLEY AUTHORITY

Large High Load Factor Industrial Power Cost
Average Cost per kWh for TVA and a Group of 32 Selected Utilities

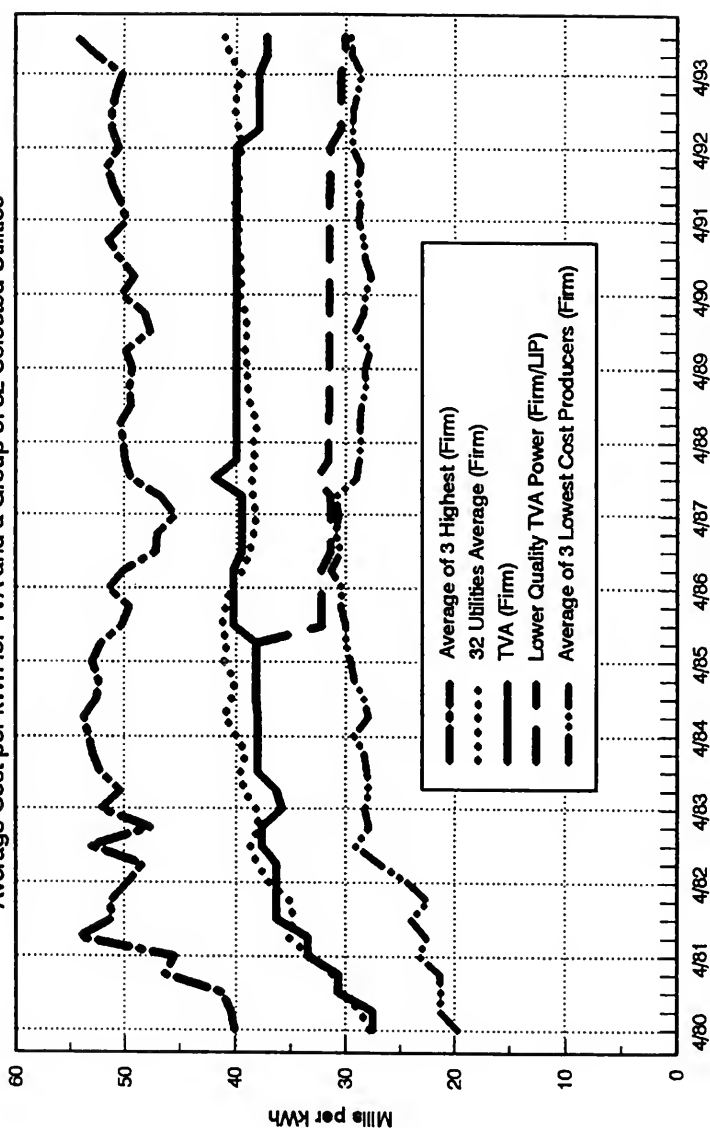


Chart 5

TENNESSEE VALLEY AUTHORITY

TVA Industrial Firm and LIP Rate Reduction Required to Meet the Competitive Cost of Firm Power in the Southeast

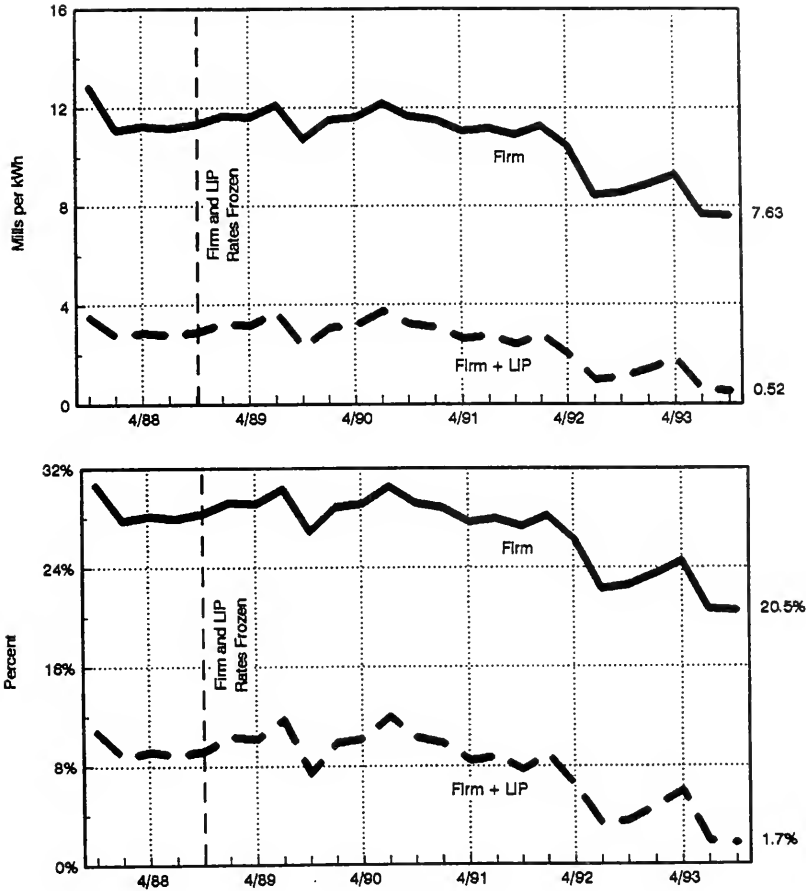


Chart 6

**Economic Development
&
Competitive Industrial Electric Power Rates**

**A Perspective Offered By
TVA Service Area Industries**

**Prepared by
Tennessee Valley Industrial Committee
and
Associated Valley Industries**

TVIC-AVI

SUMMARY

In late 1992, the Tennessee Valley Authority completed its cost of service study, an in-depth examination of the utility's actual costs for delivering electric power to its customers.

The study is an analysis to ensure TVA rates are fairly borne by its varying customer bases.

The Tennessee Valley Industrial Committee (TVIC), a group of industries which purchases power directly from TVA, and Associated Valley Industries (AVI), a group of industries which purchases power from TVA through either rural or municipal public power distributors, support TVA's efforts to properly allocate costs and make its industrial rates competitive.

Representing approximately 150 plants and production facilities in the seven-state area TVA services, both TVIC and AVI must have competitive electric rates for plants and facilities to maintain and/or grow operations and to remain major employers within the Valley. Without competitive rates, existing and/or future production orders and jobs are in jeopardy, with other regions of the country or foreign markets offering a more economically viable alternative.

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

**Tennessee Valley Industrial Committee
and
Associated Valley Industries**

- 145 + industrial facilities in TVA's service area**
- 100,000 + people employed**
- \$700 + million power cost**
- \$ Millions in state and local taxes**
- \$ Millions in payrolls**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **The TVA Vision:**
 - **To be the best electric utility in North America, and**
 - **The most productive and effective agency in the Federal Government**
- **Industry supports the TVA vision**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **The TVA Strategy:**
 - **Competitiveness**
 - **Customer Focus**
 - **Innovation**

- **Industry supports the strategy**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **TVA has made great progress in implementing its strategy**
- **Continued progress is critical**
 - **Innovative cost reductions and controls**
 - **Resource planning**
 - **Rates**
- **Industrial rates must be equitably determined and reflect cost of service**
 - **Valley industry should pay cost based rates**
 - **Valley industry cannot afford to carry the cost of other customers**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **Competitiveness**

- Valley industries are vulnerable to national and international competition -- with electricity costs being a key factor

- **Customer Focus**

- The vast majority of TVA customers - both industries and power distributors -- are in agreement on three key issues:
 1. Continue innovative cost reductions and controls
 2. Resource Planning
 3. Cost Based Rates

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

● Key Issues

1. Continued Innovative Cost Reductions and Controls

- All parties have the same interest**

2. Resource Planning

- Long term cost control**
- All parties have the same interest**
- Interruptible power program is an important future resource**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **Key Issues (continued)**

3. Cost Based Rates

- Hydro preference combined with a biased cost of service approach would thwart the TVA goal of competitive rates
- TVA and the economy of the Valley cannot afford double dipping industrial subsidies for other consumers
- Jobs and industrial production will be lost if TVA's industrial rates do not become competitive

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

The Cost of Service Issue

- There are shared goals that cannot be reached without cost based rates
 - To meet or beat the competition by 1994
 - To be America's first choice for electric power by the year 2000
- Cost based rates are essential to the success of TVA in its vision and goals
- Rates are among the most important issues facing TVA

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

Residential Rates

- Hydro preference reserves the benefits of low cost hydro-electric generation for residential consumers
- In recent years the residential rates did not cover costs (even with the benefit of the low cost hydro)
- The May 1, 1993 rate adjustment eliminated the excess hydro preference subsidy that had developed
- Residential rates continue to be among the lowest in the country

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

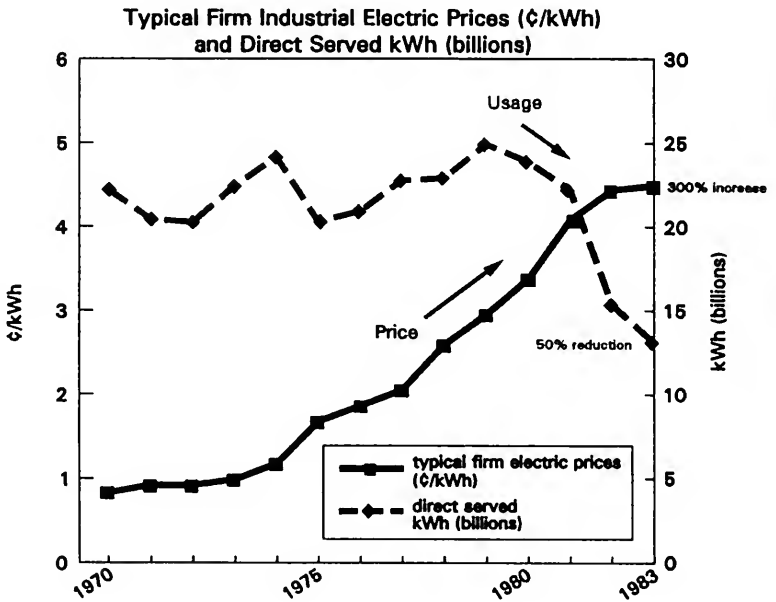
Industrial Rates

- **There are two kinds of power provided to industry -- firm and interruptible**
- **Interruptible power increases industrial risk, but reduces cost for TVA and all customers by reducing expensive new capacity additions**
- **For TVA to meet its goal for the region - economic growth 10% above the national average - both firm and interruptible power must be competitive**
- **TVA industrial rates must be made competitive without the benefit of any low cost hydro power, due to hydro preference**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- Industrial rate increases of the 1970's had created an untenable situation by the early 1980's
- Major industries were lost



TVIC-AVI

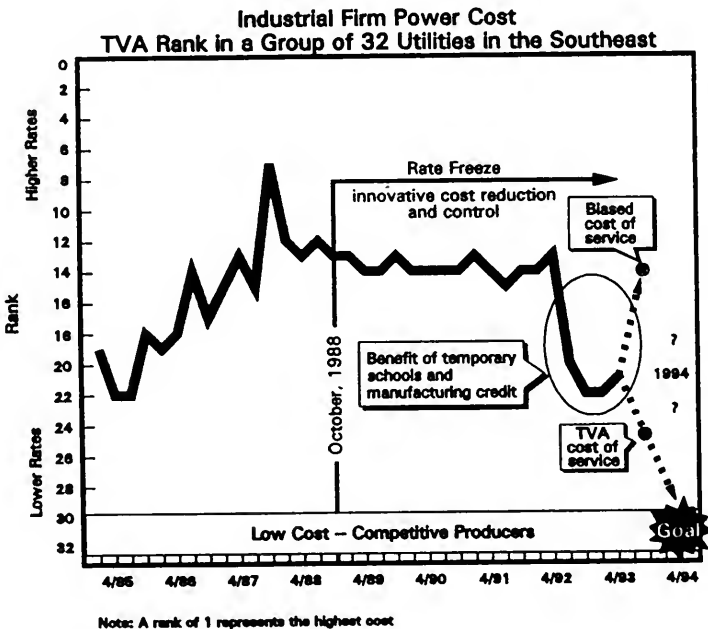
AN INDUSTRIAL PERSPECTIVE

- **TVA responded to the industrial collapse with a 3 pronged attack**
 - **Limited Interruptible Power (LIP) was created (1983)**
 - **Economy Surplus Power (ESP) was created (1985)**
 - **Firm rates were frozen (1988)**

TVIC-AVI

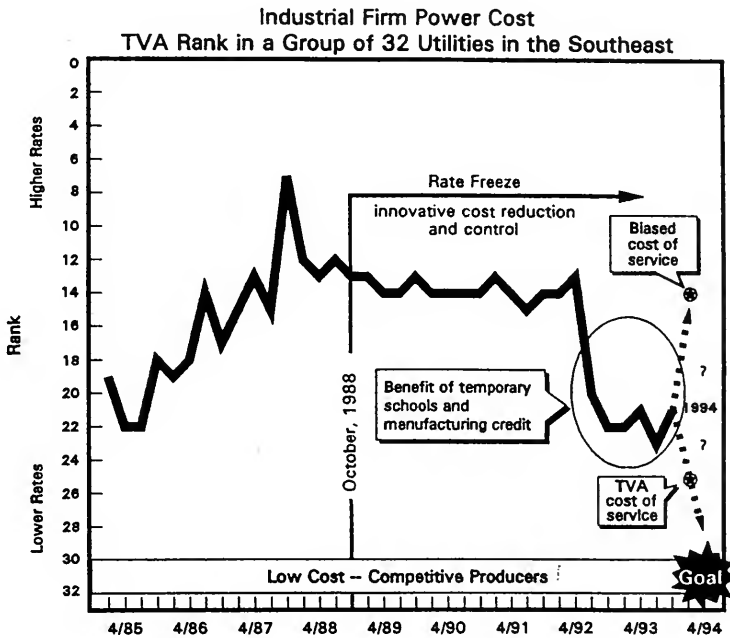
AN INDUSTRIAL PERSPECTIVE

- Firm industrial rates still are not competitive
- A change to reduce the rates to the cost of service will improve, but not resolve the competitive position



TVIC-AVI

AN INDUSTRIAL PERSPECTIVE



- This chart includes the latest data - through October, 1993

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **LIP fits into the area between firm and typical interruptible power**
- **LIP is innovative, but it alone has not solved the problem**
- **The combination of firm and LIP is lower in quality than firm power and is not price competitive**
 - **Even the proposed TVA cost of service, if implemented, would leave Firm/LIP combination higher in cost than full firm power from other low cost competitive producers**
 - **A 9% reduction in the combined cost is necessary to match the low cost competitive producers**

TVIC-AVI

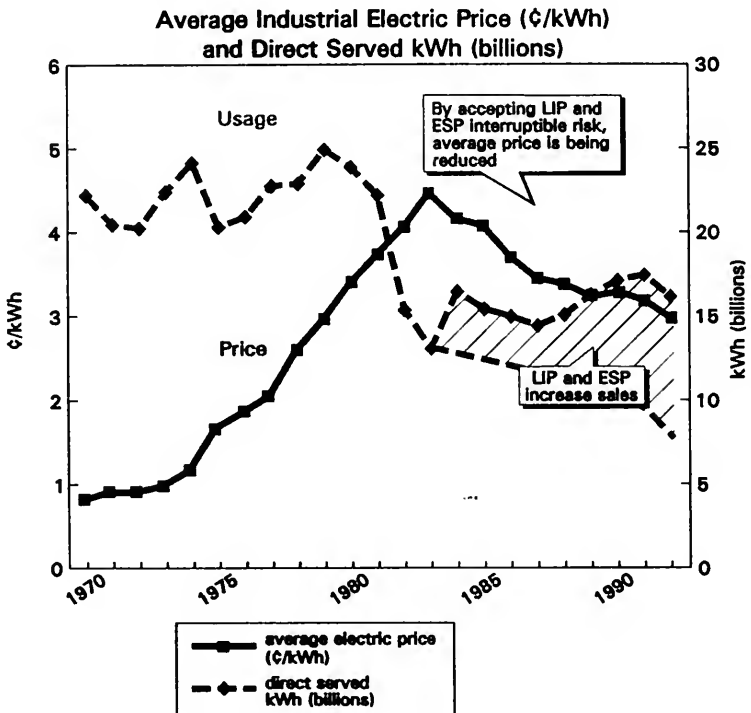
AN INDUSTRIAL PERSPECTIVE

- **ESP is an interruptible service that reduces the need for expensive new capacity**
 - **ESP is on the leading edge**
 - **ESP improves system efficiency**
 - **ESP is innovative -- pricing and customers' usage is tied to actual hourly energy cost**
 - **ESP prices increase during peak periods, providing TVA, and ultimately all other customers, with price protection**
 - **Vast majority of electric utilities use hourly pricing only for transactions with other utilities**
 - **ESP is competitive with other interruptible rates**

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

The hard work and tough choices begun in the early 1980's have increased industrial sales, along with jobs and industrial production



TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

TVA Strategic Choices



TVA Plan

Innovative cost reductions and controls

Strategic focus on resources and quality

Equitable allocation of costs

"Customer" focus

or

or

or

or

or

Undesirable Alternatives

Succumb to inflation and lose to the competition

Build as usual

Biased cost of service, ignoring competitive realities

"Ratepayer" orientation

TVIC-AVI

AN INDUSTRIAL PERSPECTIVE

- **Goals are within reach**
 - **Competitive rates by 1994**
 - **America's choice by 2000**

TVIC-AVI

ADDITIONS TO THE RECORD

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

The Municipal Rate Study Group ("MRSRG") consists of 41 municipal electric utilities in 3 states (see Appendix A), purchases 40% of the wholesale power that TVA sells and provides service to 1,178,983 residential, commercial and industrial customers. The MRSRG brings to this proceeding the perspective of purchasers of wholesale electric power from TVA--i.e., wholesale customers who will pay the costs that TVA has incurred in the past and that TVA will incur in the future. These costs are then charged to our retail customers.

The purpose of this paper is to submit our comments for your consideration with respect to TVA's Nuclear Power Program, TVA's Debt and TVA's Integrated Resource Plan ("IRP") process.

Comments on Nuclear Construction Program

As part of the cost of service study recently completed by TVA, TVA presented its evaluation of the completion of the nuclear power program as being the most cost effective power generation option for the future. Foremost in TVA's evaluation is the amount of money already invested ("sunk cost") in the nuclear plants. If the nuclear plants are not completed, the sunk cost will have to be absorbed by ratepayers without any benefit being received. Obviously, we do not want this to happen. However, TVA must not continue down the nuclear road blindly. TVA should be vigilant in the review process to make sure that the nuclear construction program continues to be the

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

least cost alternative for future generation.

Comments on TVA Debt

TVA should continually consider all of its financing alternatives and choose the least cost alternative for the benefit of the ratepayers. One financing alternative TVA should consider is allowing the municipal electric utilities to finance generation and transmission plant. This has been found to be an extremely cost effective means of lowering the cost of service for ratepayers throughout the United States.

Comments With Respect to TVA's Integrated Resource Plan Process

The MRSRG agrees with TVA's proposed IRP process and is committed to take whatever action possible to assist in that process. We appreciate the opportunity to participate and contribute to the goal of maintaining and enhancing TVA's competitiveness.

In our view, the IRP process must have a very broad focus and must seriously consider the on-going changes in the utility industry, not just in the TVA region, but on a global basis. Such things as deregulation of the pricing of generation resources, transmission access and retail wheeling could have a definite impact on TVA, its customers and its IRP process.

Given the fact that load forecasting is a critical component in the IRP process, it is very important that careful evaluation and study be given to this area. Since the need for future

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resources is based on the projected loads of the Valley, the optimum balance between demand side management (DSM) and supply side management (SSM) must be found and accurately reflected in the load forecast. DSM activities and the measurement of impacts of such activities will require full cooperation of all TVA customers.

Direct load control programs should be developed and implemented in those areas of the Valley where it makes sense. For instance, direct control of air conditioners should be considered and implemented only in those areas which have extreme summer peaks. A careful evaluation of such a program should be on-going to insure that time and resources are used efficiently.

Interruptible and curtailable rate programs should not be implemented just for the sake of enhancing TVA's near term competitive position, but as a tool to avoid future expensive generation resources. This program must also be carefully examined to insure that it results in cost savings to all ratepayers and not just in cost shifting among ratepayers. TVA should clearly demonstrate the long term benefits of this program as part of the IRP process. If TVA's rates for firm service are properly set, the temptation to offer non-cost based rates such as interruptible/curtailable as a competitive tool will be lessened.

In the supply side management area, TVA should continue to

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

pursue a thorough evaluation of its existing generation capacity to maximize the use of these facilities for the future. In its evaluation of new generating resource requirements, TVA must examine all options from a least-cost and environmental perspective to insure that its competitive position is maintained. Renewable resources, market purchases, competitive bidding, cogeneration, as well as all new technologies must be given appropriate consideration. The IRP process should be flexible to provide immediate consideration for new technologies and environmental concerns as we move into the future. No stone should be left unturned.

We agree with TVA's stated position that the most important objective for TVA's IRP is to maintain and enhance its competitiveness. This agrees with the MRSRG primary objective of paying the lowest possible cost for reliable wholesale power supply services. The cost of those services should be inversely related to the efficient use of electric power (i.e., the more efficient the use, the lower the cost) and should promote the assignment of costs among customer classes that has the potential to produce the greatest possible economic growth in the TVA service territory.

In our opinion, TVA should be among the lowest cost providers of electric power in the United States. In fact, the TVA Act requires the TVA power system to be operated on a

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

nonprofit basis and directs TVA to sell power at rates as low as feasible. Because of TVA's uniqueness as a federal utility, TVA does not incur two significant expenses that investor owned utilities incur--investor profit and income taxes. If TVA controls operating expenses and is at least as cost effective in its production of electric power as investor owned utilities, it should have a distinct cost advantage over the investor owned utilities.

It is evident to all concerned parties that TVA must prepare to meet the competitive challenges of the future. The IRP process must be designed to help meet those challenges of the future. It is critical for everyone to realize that today is the beginning of that future. We are concerned that certain actions that can be and should be taken today to enhance TVA's competitive position are being improperly linked to the IRP process and unwisely deferred until completion of the IRP process which is projected to take years. We believe realistically the IRP process should never end but should be an ongoing process. If the IRP is an on-going process, when will action ever be taken? We believe that if there are decisions that can be made today to enhance TVA's competitive position, those decisions should be made today and not years from now. A delay in making decisions relative to competitiveness could be disastrous for TVA in the near term. One specific action that can and should be

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

undertaken now is the implementation of the new wholesale rates that were determined as a result of a cost of service study recently completed by TVA. Our understanding is that the implementation of new wholesale rates is being held in abeyance by TVA until the IRP process is completed years from now. We believe this delay is a mistake and does not make sense to us. While the IRP process may eventually change the generation mix and the cost of generation in the future, TVA must still recover today's cost of generation in the most unbiased, equitable, cost/efficiency, and competitive manner possible. The cost of service study evaluated and determined the most reasonable recovery method for TVA's current costs. It also established the rate philosophies and determined the resulting rates which should be charged. Further delay prevents TVA from moving immediately to a more competitive position which we believe will promote the greatest economic growth for the TVA service territory.

We ask you to support and encourage TVA in its efforts to implement cost based rates. We believe TVA's efforts to make corrections to its rates will bring rates for the various classes of customers into a more realistic cost/efficiency relationship relative to their energy usage characteristics; would be more comparable to the ratemaking principles and methodologies used in other wholesale ratemaking jurisdictions; and, would result in rates that are more competitive with other utilities' wholesale

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

rates. More competitive wholesale rates would result in the greatest possible economic growth for the TVA service territory.

Following is a brief explanation of why the MRSG believes TVA's rates should be changed. The MRSG commissioned a study of TVA's rates beginning in August, 1989. The group wanted an independent, objective evaluation as to the reasonableness of TVA's ratemaking principles and methodologies and the resulting rates. The rate evaluation was to also include a comparison of TVA's ratemaking principles and methodologies to other wholesale rate jurisdictions. The rate evaluation indicated that significant biases, inequities and unrealistic cost/efficiency relationships were imbedded in TVA's existing rates. The group requested TVA to develop an updated and corrected cost of service study which would identify and quantify TVA's total system costs (including cost of generating resources) and address the principles and methodologies used to assign its costs to the ultimate ratepayers. TVA responded to our request with a proposed cost of service study. The study was reviewed by the TVPPA Rates & Contracts Committee and by independent consultants on behalf of the MRSG. The cost of service study proposed by TVA corrected the biases, inequities and unrealistic cost/efficiency relationships (with the exception of the treatment of the cost of hydro generation) identified by the MRSG in its independent evaluation of TVA's rates.

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

The following comparison of average wholesale firm power costs by rate group reflects data provided by TVA as part of the cost of service process:

	Current Rates <u>¢/Kwh</u>	Proposed Cost of Service w/ Hydro Preference <u>¢/Kwh</u>	Cost of Service w/o Hydro Preference <u>¢/Kwh</u>
Residential	4.13	4.57	5.16
Small Commercial	5.11	4.89	4.37
Medium C & I	4.85	4.50	4.02
Large Industrial	4.24	3.77	3.37

The data in the first column of the table shows the inequities and biases inherent in the current rates. Residential customers are the most inefficient power users on TVA's system and cause TVA to incur the most cost. Yet the residential customers pay the lowest cost for power. The basic tenet of cost of service ratemaking is that rates should be designed to recover the cost from the customer that causes the cost to be incurred. Applying this basic tenet, TVA's current rates are clearly and obviously wrong. The inequity shown here in the wholesale rates flows through to the retail rates distributors of TVA power are required to charge their customers. Appendix B compares retail rates in the TVA area with retail rates of other utilities and shows the inequity in retail rates being charged in the TVA service territory compared to how other utilities assign costs to various customer classes. This appendix shows that commercial and industrial rates in the TVA service territory are higher in

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

relation to the residential rates than any of the other utilities listed. This means the current rates in the TVA service territory assign a disproportionately larger amount of total system cost to commercial and industrial customers than any of the other utilities listed. To be competitive in all rate classes and to send the proper price signal, which will result in the most efficient use of resources, TVA should design its rates to reflect the cost of the usage characteristics of the customers. It is clear from Appendix B that other utilities have been following this fundamental principle.

Referring to the table on the preceding page, the data in the second column of the table shows the effect of correcting all of the inequities and biases, except for the hydro preference bias currently reflected in TVA's ratemaking philosophy. The data in this column is the cost of service result that TVA was proposing when they, for whatever reason, decided to hold rate change process in abeyance.

The data in the last column of the table shows the effect of correcting all of the inequities and biases in the rates and is based on the ratemaking principles and methodologies used by other wholesale ratemaking jurisdictions. This data reflects the allocation of the lower cost of hydro generation to all classes of customers and not just to residential customers.

COMMENTS FOR THE TVA CONGRESSIONAL
CAUCUS/INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE HEARINGS
ON BEHALF OF THE MUNICIPAL RATE STUDY GROUP

COMMENTS ON OTHER ISSUES

TVA's thrust in the 90's should be to position itself as a power supplier who is comparable and competitive with all other power suppliers especially those in their immediate geographic area. We as stakeholders must support their efforts to level the playing field and to become competitive, both within and without the TVA area.

There are other issues affecting TVA and its' distributors of which this Sub-Committee should be aware if the TVA Power Program is to survive this decade. TVA's greatest strength is its relationship with the 160 distributors of TVA power. This partnership has endured many challenges over the past 50 years and has met or beat the competition in most cases. It has fulfilled many of the purposes of the TVA act with a minimum of conflict and dissention. TVA has been a yardstick for the nation's electric utility suppliers by developing and utilizing its available resources to the fullest extent possible and resolving the conflicting perspectives pertaining to the many problems faced by this partnership.

For example, in the 1960's TVA, and its distributors in Tennessee, realized the rural distributors were loosing customers to annexing municipalities and received inadequate compensation for their losses. Negotiations were undertaken among the Tennessee Municipals, Coops and TVA that produced the "Tennessee

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formula" which was codified in the State law (T.C.A 6-51-112). This formula, though it has lost much of the equity it had in 1968 due to substantially increased power costs as a percentage of total revenues, has served as the benchmark for nearly all the subsequent state territorial agreements nationally and has worked relatively well for nearly 30 years. We are now involved in an effort by NRECA to prohibit any acquisition by annexation, through federal legislation (H. R. 3790), of REA financed facilities. NRECA is using the argument that Coops are loosing their best customers and the remaining customers' rates have to go up to make up this loss. The TVA power program summaries since 1975 do not substantiate this argument. On the contrary, these statistics reveal that Coops have grown at a faster rate than municipalities (45+% vs. 35+%). The latest summary (6/30/92) shows that the Coops have slightly higher retail rates(5.9 vs. 5.5 cent/KWH), and have been able to retain over 5¢ more out of each dollar in operating revenue than the municipals due primarily to improper cost allocation/recovery practices reflected in TVA's past cost of service studies. Of course the assignment of the low-cost benefit of hydro generation to residential customers has changed considerably during this period of time. This has had the tendency to further distort the competitive picture. It does not make sense to us to continue over charging commercial and industrial customers who are

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providing jobs and economic well being for our region. We believe rates should be structured to recover the cost of each class of customers imposes on our respective systems.

As you are aware, TVA functions as the regulatory agency (P.S.C.) for all 160 distributors for the Public Utilities Regulatory Practices Act (PURPA) applications. H. R. 3790 allows P.S.C. and/or other third parties to be appointed by the governor in states where no P.S.C. regulation of municipal electric systems exist. As with PURPA, this bill needs to be amended to specifically recognize TVA's existing regulatory agency status for its distributors. In addition, TVA should be required to publish their regulatory standards, similar to NARUC publications and provide them to the distributors for guidance. We are opposed to H.R. 3790 because it encroaches on the state-granted right of eminent domain and is in effect a federal solution to a state/local problem.

Finally, if we continue to insist on using the political protection of "walls", governmental immunity, and bureaucratic power, we will eventually loose the competition war regardless of how many skirmishes we win. With retail wheeling, transmission access, and Regional Transmission Groups tending to equalize generation and transmission cost, most future battles will be fought at the distribution level. We believe our best strategy is one of excellence in every area of our operation, from

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generation through transmission and distribution. Our operation should be able to stand the scrutiny of the same criteria as other vertically integrated power systems and we are ready to evaluate our operation based on that criteria regardless of whether or not we are legally required to do so. We feel that all of us, TVA and its Distributors, are morally obligated to do so. This is the only way we will be "the supplier of choice" that will serve the needs of a de-regulated, consumer driven electric system. Thank you.

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Average Revenue per KWh for Electric
Utilities in CENTS per KWh - 1992*
Sorted by % Ind. to Resid. Descending

	Residential	Commercial	% Comm. to Resid.	Industrial	% Ind. to Resid.
TVA**	5.73	6.11	106.63%	4.66	81.33%
MS-Mississippi Power & Light Co.	8.46	8.38	99.05%	6.41	75.77%
KY-Kentucky Utilities Co.	4.49	4.28	95.32%	3.36	74.83%
VA-Delmarva Power & Light	8.75	7.06	80.69%	6.41	73.26%
TN-Kingsport Power Co.	4.96	5.04	101.61%	3.45	69.56%
VA-Potomac Edison Co.	6.57	6.00	91.32%	4.49	68.34%
KY-Kentucky Power Co.	5.12	5.41	105.66%	3.47	67.77%
MO-Union Electric Co.	7.78	6.46	83.03%	5.23	67.22%
NC-Carolina Power & Light Co.	8.34	6.92	82.97%	5.60	67.15%
VA-Appalachian Power Co.	5.65	4.86	86.02%	3.74	66.19%
AR-Southwestern Electric Power	6.51	5.43	83.41%	4.27	65.59%
NC-Nantahala Power & Light Co.	6.19	5.38	86.91%	3.98	64.30%
KY-Louisville Gas & Electric Co.	5.96	5.40	90.60%	3.81	63.93%
AR-Arkansas Power & Light	9.35	7.59	81.18%	5.92	63.32%
AL-Alabama Power Co.	7.01	6.83	97.43%	4.38	62.48%
NC-Virginia Power	8.02	6.49	80.92%	4.97	61.97%
NC-Duke Power Co.	7.40	5.98	80.81%	4.50	60.81%
MO-Missouri Public Service Co.	7.90	6.67	84.43%	4.75	60.13%
AR-Oklahoma Gas & Electric Co.	6.04	5.14	85.10%	3.61	59.77%
MO-Kansas City Power & Light Co.	8.66	7.12	82.22%	4.76	54.97%
VA-Virginia Power	8.16	6.34	77.70%	4.48	54.90%
MS-Mississippi Power Co.	6.08	5.92	97.37%	3.31	54.44%
GA-Savannah Electric & Power Co.	6.79	6.79	100.00%	N/A	0.00%
GA-Georgia Power Co.	7.55	7.45	98.68%	N/A	0.00%

*All data except TVA's obtained from "Typical Residential, Commercial & Industrial Bills, Investor Owned Utilities". Compiled by the Rate Regulation Department of the Edison Electric Institute, 1993.

**TVA data obtained from "Summary of Financial Statements and Sales Statistics, Distributors of TVA Power" ending Fiscal Year June 30, 1992.



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James A. Walker, Chair, Board of Directors

Armin Rosenblatt, President

Subcommittee on Investigations and Oversight
Committee on Public Works and Transportation
586 Ford Building
Washington, DC 20515

Dear Committee members,

I am submitting the following comments for inclusion in the official record for the hearing regarding the Tennessee Valley Authority on March 9, 1994.

I write as both a concerned citizen and as a former resident of the Tennessee Valley region. If all was well with the TVA, this hearing would probably not be taking place. As we all know, that is not the case. The TVA has been courting financial collapse for some time. In 1979, Congress set a cap of \$30 billion on the debt that the agency could accumulate in the completion of seventeen nuclear power plants. Now, fifteen years later, eight plants have been cancelled, four remain incomplete, the remaining five have been shut down on several occasions because of operational and safety problems, and TVA's debt will stand at close to \$28 billion by the end of fiscal year 1994. The cancellation or the (increasingly unlikely) completion of the remaining nuclear units could cost another \$10 billion.* At the same time, the agency's competitive position is steadily weakening as neighboring utilities and independent power producers offer cheaper rates to distributors, and energy efficiency technology begins to free up the electricity market for customers and distributors alike.

The outlines of this dilemma have been apparent for some time, but TVA's response has for the most part been one of denial. The agency continues to spend 36% (\$1.8 billion) of its operating budget (\$5 billion) to pay the annual interest on its nuclear debt, but has yet to make a serious and committed attempt to investigate, much less implement, the possibilities for less costly options such as demand-side management, which utilities across the country have generally found to be to their financial benefit. The TVA has instead pursued a policy at odds with that of almost every other U.S. utility and tried to grow its way out of its problems through load-building stratagems aimed at increasing consumption. It has eliminated incentives for energy savings among its customers and distributors. As described in a June 1992 issue of Standard & Poor's Creditweek Municipal, TVA has implemented policies that remove "any economic incentive for

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distributors to pursue any type of load management... or demand-side management initiatives. In fact, there is a disincentive [for these] because any reduction in loads results in lost [income] margins... In effect, TVA's distributors are unable to participate in a number of industry-wide trends aimed at diversifying and downsizing resources."

At the same time, TVA has moved to lock its distributors into more rigid contracts that make it harder for them to leave the grid and tie them more strongly to paying off the debt. This situation can only become more inequitable as TVA's competitive position continues to erode, and, despite the help of Congressional allies who amended the 1992 Energy Policy Act to discourage transmission access within the TVA region by independent power producers, the agency cannot hope to isolate itself from the forces of the energy market forever. Dr. Alan Pulsipher, former Chief Economist for TVA, has described how the agency's "dismemberment" at the hands of an increasingly competitive energy market could occur.

Given this state of affairs, it would stand to reason that TVA would be interested in examining all of its options for fiscal and institutional survival, including demand-side management and investment in energy efficiency, both of which have provided more energy (while saving money) than any other source of energy over the past decade. If this is finally starting to happen, it is only because of the efforts of dedicated citizens and public interest groups in the region. But if the Integrated Resource Plan currently being undertaken by TVA is to have any credibility, it must be part of a complete reevaluation of the agency's policies and borrowing authority. This in turn will only happen with increased public participation, both in the form of a partnership in TVA's decision-making structure with citizens of the region, and by greater Congressional oversight, the lack of which has allowed this situation to deteriorate this far. I think that any rational assessment of TVA's dilemma has to conclude that these things have to happen if the agency is to survive and the region be spared a serious economic downturn.

I urge the subcommittee to see this hearing as the beginning of a historic reexamination and reorganization of TVA, and to resist efforts at maintaining a doomed status quo.

Sincerely,



Doug Daigle
Pacific Environment & Resources Center

* The Watts Bar units, still unfinished after 22 years of construction and \$8 billion in costs, will easily cost another \$3 billion to complete, although it has become apparent that no amount of money will allay serious issues of safety there.

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